

AVCOM'S satellite receivers continue to make me look good.

My customers get studio-quality satellite reception. And, I get all the credit.

Because AVCOM receivers live up to their performance specifications and have such high reliability, you benefit from the resulting customer satisfaction.

Ask any AVCOM dealer about AVCOM'S excellent reputation for products that work right from the carton. The first time. Every time.

Compare AVCOM'S video quality to the competition. It's unsurpassed. Carefully designed commercial-grade circuitry makes the AVCOM picture possible.

AVCOM. It means Value. Reliability. And, Service. As an AVCOM dealer it means AVCOM'S commitment to your success.

AVCOM Lets you profit from both the commercial and the home-use markets.

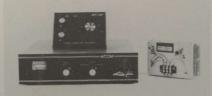
AVCOM is a leading designer and manufacturer of unique satellite communications products for both commercial and private installations. For example:



COM-661: A commercial receiver that features a detented channel selector and is compatible with AVCOM'S BDC-60 block downconverter. The result is a double conversion system that offers high stability and can be used with any brand and degree LNA. Other



features include; automatic polarity switching output, tunable audio, sensitive signal meter and rack mount.



COM-2A: The ultimate in Convenience, Economy and Performance. Attractive styling fits any home decor. Ideally suited for low cost installations and delivers maximum reliability and high performance. Features include;

- Attractive styling
- Tunable audio with switchable wide and narrow IF filters (optional)
- Remote control console
- Internal crystal controlled modulator
- Unclamped video output for decoders



COM-3R: Now with APS-24 Auto-Polarization Selector standard. The full feature COM-3R is used around the world for a wide variety of unique TVRO installations. Threshold peaking and selectable dual IF filters are optionally available for receiving international type transmissions.

Call your AVCOM representative today. It's a sure way to continue looking good.



500 Research Road. Richmond, VA 23236 (804)794-2500 Toll Free Order-Only Line 800-446-2500

TOP OF THE MONTH

CONGRATULATIONS! More than 200 dealer-readers completed their May '84 CSD industry survey forms and we now have the best 'profile' of a typical dealer, and the economic health of our industry, the industry has ever had. See how your dealership 'measures up' starting on page 8 here this month!

JOHNSTON Island/Atoll. That's in the Pacific Ocean; all 655 acres of sand and coral. A most unusual TVRO installation went in there, late in May, and we think you will be intrigued by the story.

GALAXY's far-flung hemispheric-zone coverage is opening up dozens of new potential areas for TVROs. Would you believe AFRTS into Africa and Europe off of Galaxy Two, or, HBO (et al) well past the International dateline in the Pacific on Galaxy One? It's here, this month.

RE-BROADCASTING multiple channels of TVRO signals using a single television transmitter is another approach to 'shared TVRO' service as we see here this month. A brand new approach to TV transmitter design has been tested and we tell you all about it.

LNA noise temp and gain have you confused? Perhaps our report this month will help you sort out the usefulness of 30 and 40 dB gain LNAs.

JULY 1984

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OUR COVER/ 850 miles west/ south-west of Hawaii, USS's Doug Dehnert (left) and Coop are equipped for work on the 30-foot monster dish in the background. You may have heard of television that 'stinks' but have you ever heard of an entire island that stinks? Details on page 26 here and in Coop's Comments!

COOP'S SATELLITE DIGEST



PERFORATED PERFECTION

Make the break from mesh to a higher quality seethrough dish. Take a look at Winegard's perforated aluminum 10-footer. There's nothing else like it on the market.

Winegard's new dish has a sharp, clean look of quality. It's a new level of dish technology offering advantages other see-through dishes can't deliver. Like 39.5db gain, F/D "Deep Dish" ratio of 0.283, lightweight yet rugged construction, super-simple assembly, weather protection, high performance and a look of class that your customers will appreciate. What more could you ask for?

A TRUE PARABOLA

The ultimate goal in designing a satellite dish is to create a reflector that is a "true parabola" - providing "near-perfect" efficiency.

Winegard engineers have developed the truest parabolic dish of any of the see-through category. Each petal, rib and outer ring is stretched-formed to a parabolic shape with specs so tight it took months to perfect the process.

Our exclusive extruded rib and locking system has simplified assembly, eliminating the need for hundreds of bolts, nuts, washers and fasteners. Every time you attach a bolt, screw or fastener to a dish you add another stress point, distorting the shape. With Winegard's extruded rib and locking system, the stress is uniform across the dish, maintaining its true parabolic shape and integrity.

LIGHTWEIGHT BUT RIGID PERFORATED ALUMINUM

Not only is the Winegard perforated aluminum dish lightweight and easy to handle, but it is extremely rugged, durable and well constructed. You can actually see through the perforated petals which are constructed of .040-gauge anodized aluminum. The extruded aluminum main ribs, which provide the basic structural support, are 1/8" thick. The locking ribs are .070" thick and lock the perforated aluminum petals tightly in place. A double-walled outer rim provides an area to insert rim splices at all joints for perfect alignment and additional strength.

Wind-loading capabilities are outstanding with a wind survival rate of 125 mph. And, because the perforation eliminates 36% of the surface area, the dish diffuses solar heat, decreasing amplifier noise.



SHIPPED IN FOUR SEGMENTS FOR QUICK AND EASY ASSEMBLY

Winegard's 10-foot perforated dish is shipped in four quarters. Total weight is only 92 pounds. It's easy to handle and transport. All that's required for finished assembly is fastening the main ribs together with 16 stainless steel nuts & bolts; placing four rim splices into the outer rim; and securing with 8 screws. Just a 20 to 30 minute job for two people.

EIGHT COMPLETE 10-FOOT SATELLITE TV PACKAGES

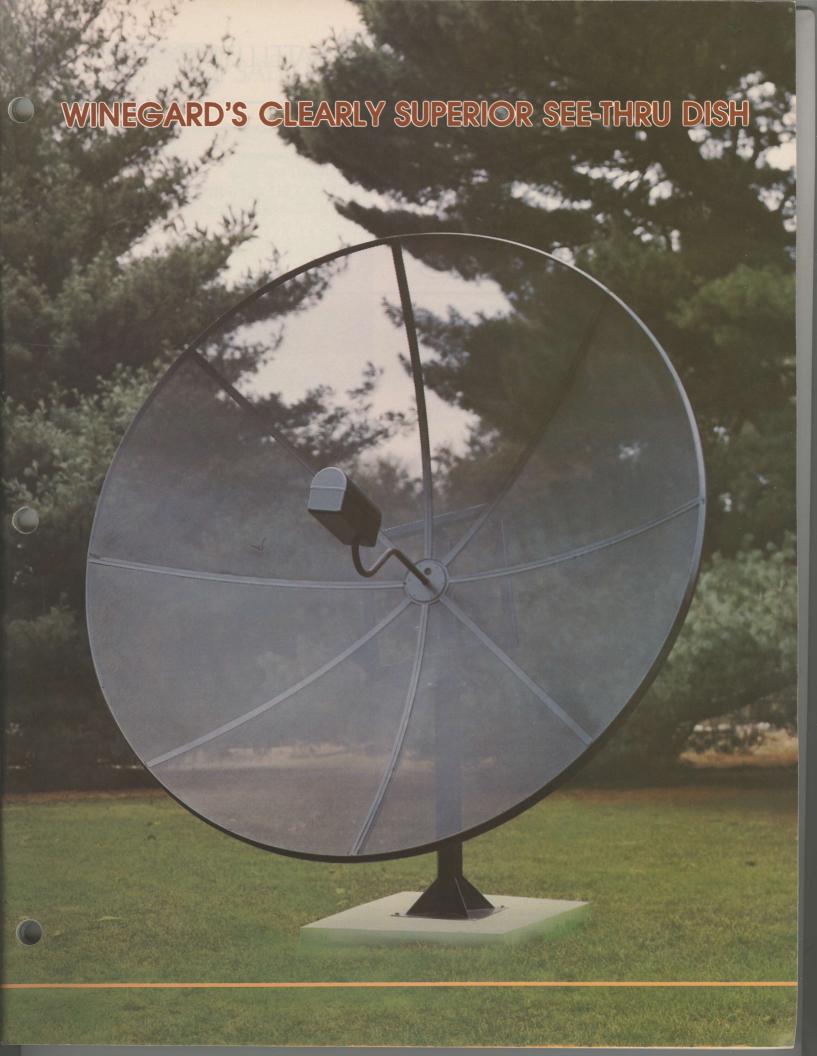
Winegard offers eight complete 10-foot perforated satellite systems that include antenna, pedestal or post mount, back-up structure, Polarotor I, 24-channel receiver, LNA, wire and a choice of motorized or non-motorized. Available in satin black baked enamel or smoked chrome anodized finish.

Winegard perforated . . . a new standard of excellence.



Anniversary
WINEGARD
TOURDED
1954

© 1984



COOP'S SATELLITE COMMENT

- KOREAN Intrigue
- CREMATED On Johnston Atoll
- COMING Attractions

OPENING Up New Frontiers

The concept of extending North American Domsat signals into regions of the world where one would not anticipate finding CNN or HBO has been with us since the first industry-wide SPTS 'Seminar' event held in the summer of 1979. The 'art' of extending Domsat signals was refined by Hero Communications' **Bob Behar** in the years '80 and '81 as Behar traveled extensively throughout the Caribbean, South America and Africa. **CSD** reported on the pioneering of Behar et al and from those reports and subsequent installation of 'native terminals' by local entrepreneurs, a new data base has been formed. The bottom line, as we repeatedly re-discovered, is that if you really put forth the effort, you will **often find** usable levels from American and Canadian satellites in some very unlikely places. In our feature report here this month we explore the 'opening of the Pacific region' to U.S. Domsat services.

As I have repeatedly written in these pages, there has been 'hard evidence' of the availability of North American Domsat signals in regions far to the **south of CONUS** for many years. There has also been 'paper evidence' of the 'likely availability' of Domsat service **into regions of the Pacific** as well; regions beyond the so-called 'fringe coverage' of the U.S. Domsat birds which routinely spray reduced footprints into Hawaii. I have urged readers to take portable antennas 'in hand' to head into the Pacific to locate those signals, sure was I that several new marketing opportunities existed. When little data came back to us it eventually became apparent that if the pioneering work was going to be done, I was going to have to take a lead role in getting it off the ground.

For some time now I have had access to a set of Hughes antenna test range plots depicting the actual transmit antenna tests for the Galaxy One satellite. Similar antenna range tests for Westar 5 and RCA's F3R are also available; if you know where to look. These test range results differ from the more easily accessed 'FCC-filed' footprint patterns because the original antenna range tests include 'sidelobe data' which is eliminated from the FCC filed data. Let's suppose, for example, that the antenna test range reveals an area that is 12 dB below the boresight beam, in a region 300 miles across. This 'RF/ signal puddle' may rise in a location 3,000 miles away from the boresight; an 'island' of signal caused by some anamoly in the transmit antenna/feed system on the bird. If you could lay that antenna test range plot over an appropriate mecator projection of the world, you would discover what part of the globe might have an unexpected 'bonus signal' from the bird, which would be (say) 12 dB below the boresight beam.

Armed with a considerable stack of such data, USS's **Doug Dehnert** and I set out into the Pacific late in May to complete an analysis of the Pacific region. We would come back far wiser for the experience and generally pleased that we had created a new 'marketing region' for TVROs in perhaps 25% of the world; not an insignificant advance in the data base previously available. For the bottom line(s) of what we found, and could deduce, I refer you to the appropriate twin-features in this issue.

Our first stop after leaving Los Angeles on a UA jet was Honolulu. There we met with **Bob Campbell** of **STARFIRE Satellite** of Hawaii. Campbell had just returned from a sojourn to Tahiti where, armed with a 16 foot dish and an **AVCOM 3** International receiver, and a **California Amplifier** 75 degree LNA, he had confirmed that there are usable



HAWAII'S BOB CAMPBELL (left) shows off his 16 foot mesh dish to USS's Dehnert. Edge-siting was interesting and the mount moved around in the wind. 'Maybe it works as good as a 12 foot real antenna,' suggested Dehnert.

F3R signals at a location some 18 degrees SOUTH of the equator (!). Campbell is a young pro in our business, having been bitten by the satellite bug early in 1980. Working for a firm headquartered in Las Vegas (Nv) he claims to have been (one of) the first to actually manufacture for sale screen mesh type dishes (April of 1980). Presently he is attempting to establish a home and SMATV TVRO business in Hawaii. Because he is by nature inquisitive, and because part of his marketing program includes regular newspaper advertising in Honolulu newspapers (which are flown throughout the Pacific), he has had a substantial number of inquiries from throughout the Pacific. Campbell gave us several hours of his time and we closely inspected his pictures on a 16 foot screen wire mesh dish located at his office. We were impressed, especially when Dehnert did a close analysis of



NBC off of F1R (TR8) is not exactly a slouch signal off the Campbell 16 footer in Honolulu . . .



BUT THE ABC SIGNAL off of T301 on TRs 10 or 12 will knock your socks off (or force you to shut your eyes in dis-belief; that a boy Peter!).

the dish and came to the educated conclusion that, at best, the 16 footer at Campbell's office was the functional equivalent of perhaps a high quality 12 to 13 footer. After debriefing him on the Tahiti reception tests, Dehnert and I turned in for the May 19th early flight to our destination; **Johnston Atoll** located at 17 degrees north and some 850 miles west/southwest of Hawaii.

Our Air Micronesia flight to Johnston was uneventful and two hours long. You do not travel to Johnston unless you have an official invitation. We had one from **Colonel Pat Moore**, the Airforce Commander on Johnston. Dehnert and USS had been working with the Johnston facility for more than a year and it was April 02, 1983 that Johnston first put into operation a 30 foot military surplus dish which they had found on a surplus list. The dish had arrived at Johnston less a mount or feed; a basic reflector surface only. Using local talent, they had designed and built a support structure for the big dish and because more than a decade prior a missile tracking dish had been on Johnston atop a special support building, they elected to place the new TVRO dish in the same location.

"I know who you guys are!" said the chap who met us at the bottom of the stairs as we off-loaded from the Air Mic 727. He was obviously pleased to see us. The only other passengers getting off at Johnston were military and a pair of scientists from some obscure U.S. government agency. The plane's travels were just getting underway; it

would go on to Majuro, the Caroline Islands, and eventually end up on Guam.

A smiling welcoming committee shook our hands vigorously and we were led into a chamber where a fellow in an Army uniform gave us a 'briefing' on life on Johnston.

Nobody had bothered to warn us in advance; Johnston Atoll is today 650 acres in size. That is not large, but, not many years ago it was 65 acres and the island is actually growing, quite rapidly. There are presently 350 people there but in the immediate past it has been 'home' to as many as 3,500. Back in the late 50's and 60's, Sandia Corporation had a contingent there to track and control 'atmospheric testing' of atomic-type instruments of destruction. The tests were mostly done to the south, over the Marshall Islands, and you don't sit or stand 'under' an atomic or hydrogen bomb and measure its performance. Not more than once, anyhow. Johnston was 'safely' to the north and within microwave line of sight range to the rocket boosted bombs being tested.



OH DEHNERT/ how come they made US get out the rear door? We found out shortly. This Air Micronesia plane has the entire forward 50% converted to cargo space. Ever fly with a dozen squalling pigs on board?

"Inside this case is your personal gas mask," explained the Sargeant. "In the event of an emergency, the sirens will warn you to take the mask out of the case and place it over your head like this...". Then he made Dehnert and I practice the gas-mask putting on exercise.

Johnston is today many things for many different agencies. Of instant concern was the storage, here, of enough chemical warfare material to equal that utilized by the U.S. in perhaps ALL of World War Two. If the Mustard and Nerve and other deadly gases stored here were not disconcerting, the 'Agent Orange' storage was. When the Vietnam event was over, there was enough **Agent Orange** remaining to defoliate most of Thailand. It is so deadly that it defies normal disposal. You cannot bury it, burn it, or dump it into the sea. You have to store it and Johnston is one of a handful of storage sites.

"In the event there is a 'leak' and you find yourself downwind of the 'leak,' explained the Sargeant, "reach into your mask case where you will find three tubes." I looked and sure enough there they were; marked 'A,' 'B,' and 'C.'

"Immediately take the 'A' tube, break off the end cap, and inject your buttox with a swift jab." He demonstrated without activating his own plunger. "If, after 5 minutes time, you feel any blisters forming on your body, repeat using the 'B' tube. And, if after 5 more minutes you still feel any blisters, repeat with tube 'C.' " Unsaid was that if after tube 'C' had been injected into your buttox you were still feeling or seeing blisters forming on your skin, you were a goner.

"The gas mask should be with you at all times," he went on. "It is your responsibility to be prepared for any emergency situa-

COOP/ continues on page 74



The BR Futureproof™ Warranty. It Protects Something More Valuable Than Equipment: Your Reputation.

Word of mouth advertising from customers can make you or break you. So make sure you get compliments—not complaints—with BR's exclusive "Futureproof" five-year warranty. It's the first opportunity for TVRO customers to buy an extended protection plan for their systems at the time of purchase just like they buy for their cars.

As a BR Satellite Communication dealer, you can offer "Futureproof" coverage for a minimal cost to your customers (and a profit for you).

Backed by one of the world's largest insurance companies, BR Satellite will guarantee all electronic components against any manufacturer defects for a total of five years (Including the first year which we cover automatically). Contact us to discuss all the details—then "Futureproof" your reputation.

Immediate Free Replacement Service.

BR Satellite is the only distributor in this industry who will replace any defective TVRO product with a new unit, just by making one toll-free phone call. **Before** you send the defective unit back and at **no** cost to you.

The "Futureproof"™ Decal—a Sign of Success.

If you've got it, flaunt it! The "Futureproof" warranty sticker in your store window could be your best salesman. We'll send brochures and in-store displays, too.

Our Standard Warranty—Still the Ultimate, Still Free.

Every piece of equipment we sell is backed by our unconditional replacement policy for a full year.*

It's an irresistible sales tool, and it won't cost you or your customers a cent.

We'll ship a replacement via UPS Blue Label, at our expense, the same day you call us. We ask only that you ship the defective unit, at your expense, within 5 days *after* you receive the replacement.

At BR Satellite, there is

no "turnaround" waiting time. And only a bare minimum of your valued customer's down time.

We Distribute More Than Equipment: Free Ads, Brochures and More!

Our total dealer support program can provide you with ad art, ready for you to run and brochures to educate customers.

Famous Names. For Dealers Only.

MTI ECI Antennas NORSAT LNAs Chaparral Earth Terminals Wilson Microwave Systems USS Maspro Dexcel

BR Satellite

Arunta
Sat-Tec
Seavey Engineering
Newton Test Generators
Satellite Ground Components
ERI LNA Jumper Cables
Earth Station Accessories
Coax-Seal

Toll-free ordering. Same Day Shipment.

Every product we distribute is in stock at all times. If you call our toll-free number before 2 PM, we'll ship your order the same day. And unlike some distributors, we're happy to ship C.O.D.

*All products and items discontinued during warranty period not subject to immediate replacement.

"We Distribute Trust."

1-800-424-2010



BR SATELLITE is the only distributor in this industry who will replace any defective TVRO product with a new unit. We'll ship a replacement via UPS Blue Label, at our expense, the same day you call us.

With Norsat's LNA, Your Customers Will See Less Noise. With Our 1 Year Warranty, You'll Hear No Noise From Them.

ntroducing the quiet one—the remarkable Norsat LNA! Norsat has combined years of experience with traditional Japanese manufacturing excellence to produce a low noise amplifier of exceptional quality.

Quiet quality, for better pictures even on today's smaller dishes.

Degree for degree, dollar for dollar, the Norsat is simply the quietest, most

efficient LNA ever made.

Unique all GaAsFet four stage design (no bipolars) with min. 51 db gain.

Total weatherproofing precision milled recessed top cover; computer-milled aluminum body.

Grounded input probe for maximum protection against failures due to lightning discharge or high ambient RF fields.

Triple sealed and ruggedly mounted type "N" output connector.

Low VSWR resonator for transparent impedance match into the first GaAsFet stage.

Separate power supply board featuring ultra-stable regulation with built-in protection against polarity reversal, voltage fluctuation, and static discharge.

Available in 100°, 90°, 85°, 80°, and 75° noise temperatures.

It all adds up
to quiet confidence—
the knowledge that your
customers are getting the
best LNA performance

for the price. BR Satellite is proud to be the only distributor in the Eastern

United States for Norsat LNAs, and one of only three distributors nationwide.

Quantity Prices Available.

"We Distribute Trust."

Dealers Only.

/I@RSAT

1984 INDUSTRY DEALER PROFILE

DETAILED Analysis

The 1984 CSD Industry/Dealer Product Survey is now history. The first such 'study' of dealer buying and equipment use trends appeared in CSD for July 1983. Our 1984 'survey' was far more comprehensive than the 1983 version; we estimated the typical dealer would spend close to 30 minutes completing the survey forms (5 pages in all and more than 80 separate questions). We added an incentive this year as well; from all of the survey forms submitted prior to May 31st, CSD would (on July 1st) make a 'random out-of-the-barrel' selection and the fortunate dealer selected will receive a 'Five-Day, All-Expense-Paid' vacation for two people on Providenciales in the Turks and Caicos Islands. The 'winner' of the drawing will be announced in the July 15th edition of CSD/2.

Fun and games aside, the 1984 'survey' was surely the most comprehensive ever attempted in our industry. The results were in some cases startling, revealing a 'profile' of dealer operations which was never before possible. The amount of data submitted in 'rawform' was staggering:

- The number of dealers participating was up 27% over the 1983 'Survey':
- Each dealer was requested to answer 85 separate questions, resulting in more than 20,000 separate 'data entries' to be tabulated;
- 3) In the 1983 survey the primary focus seemed to be on warranty and repair 'service' problems. The 1984 survey results suggest that while service and warranty remains a top concern of dealers, they are as, or more, concerned about more futuristic matters in 1984; pending legislation rated high, for example.

The amount of data, and the tabulated results, was so extensive that there is no way **all of it** can be published here in CSD. Consequently, we have prepared a 'HOME TVRO Marketing Book' which will be distributed later this month. Automatic distribution of the volume will be to each of the dealer firms that submitted 'raw data,' plus to those OEM and distributor firms who attracted 1% or more mention in the survey itself. Others who would like a copy of this detailed analysis of the 1984 TVRO Marketplace have to but contact Carol Graba at the CSD office (*) to request a copy.

WHAT WE Now Know/ about dealers

From all of the data collected and compiled, we now have, for the first time, an accurate 'profile' of a 'typical' dealer. We present this profile in table form for those who don't care to read through the mountain of statistics that created this profile. We have left on the table a blank section where you, the dealer, can fill in your own information/numbers. If you will complete the table in this fashion, you will then have a direct 'comparison' of your operation to the 'typical' dealer, nationwide. Yes, after you do this, CSD would appreciate a Xerox (or other) machine copy of this full page so we can see how **you** did!

HOW MANY Dealers?

There are two perplexing numerals in our industry. They are:

- 1) How many TVROs are being sold (per month, per year), and,
- 2) How many dealers are in our industry?

Both numbers are badly hyped by people who have either their own ax to grind, or who simply have not taken the time to study the situation. For the first time, we feel we have an accurate handle on both numbers. We'll take you through both exercises and explain how we arrive at our numbers.

Various information sources (primarily magazines in the industry) are apt to quote numbers as high as 15,000 when asked **how many DEALERS** are in this industry. Let's first see what a number as high as 15,000 means:

- 1) It means that given the land mass of the 48 CONUS states, there would be ONE dealer every 16 miles in every direction. If each of the 15,000 'dealers' were evenly spaced so that each had his or her own exclusive territory, each would have just over 200 square miles they could call their own. That would include, of course, the entire 48 state area with no exclusions (including water area). **Keep in mind** the vast areas of the 48 states which have fewer than 10 people per 200 square miles (areas west of the Mississippi).
- 2) It means that for the 4,000,000 US homes which a 1970ish Senate committee studied and found minus even threenetwork TV service, we would have one dealer for each 266 such homes. If we attribute 3.8 people to each of these 266 homes, we have one TVRO dealer for every 1011 people living in those homes that are 'underserved' by the major three networks.
- 3) Or, if we take only those homes that do not yet have cable television service, we find there are 48 million such households. Each of the 15,000 dealers attributed to the industry would have an 'exclusive' selling potential of 3,200 homes. The present penetration of home TVRO systems is but 0.008 or 8/10ths of one percent. That would mean that each of the (15,000) dealers would have sold between 25 and 26 terminals to date.
- 4) However, if you include only the first 4 million ('underserved') U.S. homes, and still apply the 8/10ths of one percent 'penetration' number, you come to 2.(13) systems sold, per dealer, to

Our analysis of the dealer reports submitted tells us that the 'average' dealer has the following profile:

- 1) He has been in our industry 25 months;
- He is presently averaging 1.358 sold terminals per week, or 5.70 terminals per month;
- 3) He sold 67.91 terminals during calendar year 1983;
- 4) His 1984 'rate of growth' is 73.70% (he will sell 50.05 MORE terminals during 1984 than he did in 1983) for a total of 118 terminals during calendar year 1984.

From his first entry into the field, he has sold a total of 139.94 terminals (in 25 months). That is a useful number, but it is merely the first 'key number' in our quest.

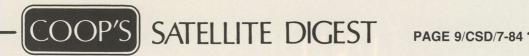
The profile-dealer serves (covers) an area that is **66.41 miles** in radius. We'll see how many employees he has, and vehicles, to acomplish this, separately. Applying the square area of a circle formula, we see he 'covers' a region of 13,855 square miles. And, he tells us that within that 'service area' he has **14.23 competitors** also selling TVRO systems.

The United States (48 states plus District of Columbia) has a total land (and water) mass of 3,022,387 (square) miles. If each 13,855 square mile section has 15.23 TVRO dealers (our original survey-dealer **plus** his 14.23 competitors), each such 'chunk of ground' accounts for 15.23 dealers. There would be 218.(140) such 'chunks' of land mass within the CONUS region (including water-mass area as well as land).

If there are 218.(140) such 'market chunks' within CONUS, and 15.23 dealers in each non-overlapping 'chunk,' then there are 218.140 times 15.23 or 3,322 'TVRO dealers' in the United States (48 states) today.

We have already defined that the typical (average) dealer has been in the business 25 months and that while he averaged 1.358

^{*/} For your own copy of the '1984 CSD TVRO Marketing Book,' call Carol Graba at the CSD office (305/771-0505) or write Carol requesting a copy (Carol Graba, CSD, P.O. Box 100858, Ft. Lauderdale, Fl. 33310).



DEALER PROFILE/ How Do You Measure Up?

Typical	Category	Your Dealership
25 months	Period selling TVRO systems	Tour Beareromp
Did NOT attend	Las Vegas shows	
Will attend	Nashville joint show	
Paraclipse/	Antennas carried	
Prodelin/	7 III O O O O O O O O O O O O O O O O O	
D&H/		
Janiel		
Chaparral	Feed brand used	
With antenna	Type mount selected	
Avantek/	Brand(s) LNAs	
Drake/	Diana(3) Livas	
Cal Amp		
Drake/	Brand(s) Receivers	
KLM/	Diana(3) Neceivers	
Luxor/		
AutoTech		
With receiver	Modulator	
With receiver	Stereo Processor	
1.358 systems	1983 Average Per Week	
2.13 systems	April '84 Per Week	
2.70 systems	May '84 Per Week	
\$2990.56	Average System (installed)	\$
73.70%	Forecast 84 over 83	%
Single Owner	Ownership structure	
3.53 employees	Number employees	
1.43 vehicles	Business vehicles	
Yes	Trailer mounted antenna	
Stand-Alone	Type business	
Yes	Newspaper advertising	
Yes	Yellow page advertising	
No	Direct mail advertising	
No	Radio advertising	
No	Television advertising	
Yes	Place of Business/posted hours	
66.41 miles	Distance serviced	
14.23	Number competitors	
No	Member SPACE?	
Yes	Buy mostly from distributor?	
Yes	Offer TVRO Financing?	
Yes	Local banks used?	
No	Local finance companies used?	
No	SFPC used?	
No	Financing more than 20%?	
12 months	Customer warranty given	
No	Anti-TVRO zoning?	
NOTE: Fill this form in	just for fun' to see how your TVRO dealership 'meas	sures-up' with the 'national
average/typical dealer.' Then will Box 100858, Ft. Lauderdale, F	nen you have studied it, why not send off a quick copy to send of a quick copy to send of a quick copy to send off a quic	o CSD Dealer Profile, P.O.
Name of dealer:		
Address:	City:	
State: Zip:		



Watch what happens when a strong, dedicated company takes a new technology and does something better with it. □ Uniden® Satellite Technology Group. We've put two decades of telecommunications experience into a full line of satellite television receiving equipment that reaches beyond anything you've seen before.

uniden®

Satellite Technology Group 15161 Triton Lane Huntington Beach, CA 92649

NOW

FRANCHISING



"THE SATELLITE STORE"

PRESENT AND FUTURE DEALERS
THE OPPORTUNITY YOU HAVE BEEN
WAITING IS NOW AVAILABLE

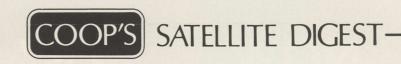
- NATIONAL ADVERTISING
- CONSUMER FINANCE PROGRAM
- EXTENDED WARRANTY POLICY
- TRAINING SCHOOL
- EXCLUSIVE TERRITORIES



A BROOKS
"THE SATELLITE STORE",
CAN BE YOURS IF YOU QUALIFY.
FOR ADDITIONAL INFORMATION, WRITE

BROOKS SATELLITE INC. 42 Edgeboro Road East Brunswick, New Jersey 08816 This advertisement is not to be construed as an offer to sell franchises. Such franchise offers may only be made upon presentation to an interested party of a full federal trade commission disclosure document and in accordance with state regulations which may apply.

PAGE 12/CSD/7-84



sold-terminals per week during 1983, he sold 139.94 terminals since entering the business 25 months ago. How many TVRO terminals have been sold?

If there are 3,322 dealers and each has sold 139.94 terminals in his 25 month 'tenure,' there are 3,322 times 139.94 (terminals) or 464,881 TVRO terminals in the United States (May 01, 1984).

From this statistical analysis we can now move forward or backward to determine not only where the industry has REALLY been in the past, but where we are likely to be in the future. There is one shortfall with this approach; this is a 12 month 'average' analysis and other than two 'spot months' we studied individually (April and May 1984) no month by month analysis for a full year can be 'pulled-out.' In other words, analysis of our raw data is not going to help you determine how many LNAs to have on hand in September and October when sales fly through the roof!

SO/ How Many Dealers?

There are between 3,155 and 3,488 (±5% accuracy window) REAL dealers in this industry at this time. So what about those '15,000 DEALER NAME mailing lists'?

There are two possible explanations; three if you include deliberate 'lies.

- 1) Some people will place 'anyone' on a 'dealer mailing list.' For every REAL dealer (the 3322 identified), there must be at least 5 people who have thought about being a dealer, or who have 'claimed' they are a dealer to get their hands on a 'wholesale/ dealer' pricing list.
- When people subscribe to a (certain) program guide publication, they are asked to identify their areas of interest. 'Dealer' is one of the options offered. Since the publication(s) freely advertise(s) special 'wholesale pricing' to 'dealers,' it is only human that you will fill in the 'dealer square' if you think that might get you a special price list or discount.

Having disposed of the two primary 'numerical myths' that seem to give most people 'fits,' now let's see how the products of the industry and the industry's REAL dealers are doing in mid-1984.

VERIFYING Our 3322 Number

There are other ways to check ourselves on the accuracy of the dealer-projection (3,322 dealers in all). Take those who report they are 'members of SPACE,' for example. In our 1984 survey, we asked dealers to tell us if they were, or were not such members. Of the total number of dealers who said they were SPACE members, we had a certain percentage of the total responding (under 30%). We then took that percentage and expanded it to see how many total 30%. We already knew how many SPACE dealer members there are because we mail CSD/2 to each of these dealers as a monthly 'gift' from CSD. If we knew the number of SPACE dealer members (no, it won't be published here) and the percentage of our survey participants who said they were SPACE dealer members, a quick calculation would reveal how many total dealers there might be in the REAL dealer universe. Our calculated number, using these two knowns, comes to within 5% of our separately arrived at 3,322 'number' for dealers nationwide.

There are numerous other checks as well; for example.

1) We have certain knowledge about the shipment of antennas (for example) from several of the OEMs. From this knowledge we can create an average month (such as April 1984 which we specifically measured) and then look at the dealer-reported 'use-rate' of antennas for those specific manufactuers. If we know how many antennas the OEM shipped (we do, through confidential information sharing) AND we know what percentage of dealers are using that antenna (and their rate of use) we are only a calculation away from the total number of systems installed for that specific month (year, etc.).

All of these calculations come within 5% of the dealer profile we have created separately, with only a handful of notable exceptions (*).

CSD Dealer Stats

The following data represents survey forms completed by approximately 6.8% of the projected dealer universe (3,322 dealers). Our dealer-range is 'complete' from annual sales dollars as low as \$11,962 in 1983 (4 systems sold) to \$939,036 in 1983 (314 systems sold). 1984 projected sales figures will be shown.

Our method of presentation will be to take the questions in the approximate same sequence as they appeared in CSD for May (01). Years Selling TVRO/

We gave dealers 13 choices between 3 months and 'more than 3 years' as we tabulated the results.

- 3 Months / 0%
- 6 Months / 0%
- 9 Months / 4.9%
- 12 Months / 12.0%
- 15 Months / 5.0%
- 18 Months / 12.2%
- 21 Months / 2.9%
- 24 Months / 13.1%
- 27 Months / 1.1% 30 Months / 7.3%
- 33 Months / 2.1%
- 36 Months / 2.7%
- 3 Years + / 36.6%

As you can see, we have two interesting groupings here; 28.3% of all dealers have been at it between 18 and 24 months while the largest sub-group has been in the business for more than 3 years.

Shows Attended

Of the survey respondents, 42.6% said they attended one (or both) of the Las Vegas shows (57.5% did not attend either show).

The same dealers surveyed project their future show attendance as follows:

- 1) Niagara Falls 27.7% (amounts to 920 REAL dealers);
- 2) SPACE August Show (*) / 21.3% (amounts to 707 REAL deal-
- 3) STTI Nashville Show (**) / 56.9% (amounts to 1890 REAL dealers).
- */ SPACE August show now combined with STTI Nashville show first week in September.
- **/ STTI Nashville show now combined with SPACE August show first week in September.

This suggests that the Nashville show will attract a crowd no less than 14.3% LARGER THAN the twin Las Vegas shows this past March. Early reservations seem mandatory or you may be sleeping in Memphis!

Antenna Lines Carried

The following antenna models are being carried in the re-sale line for 5% or more of the total dealers:

- 1) Paraclipse 12' / 35.4%
- 2) Prodelin 10' / 31.0%
- 3) Paraclipse 9' / 18.8%
- 4) D&H 9' / 16.9%
- 5) Janiel Dark Star 12' / 16.5%
- Janiel Dark Star 10' / 16.5% 6)
- Prodelin 12' / 12.4%
- 8) D&H 8' / 8.6%
- 9) Intersat Challenger 11' / 8.1%
- 10) Janiel Dark Star 9' / 7.9%
- 11) ADM 11' / 6.3%
- 12) Odom 10' (2 AND 4 piece) / 6.1%
- 13) UFI 10' / 5.9%

These percentages should NOT be confused with 'market share' (i.e. you cannot multiply the total market — month times the Intersat Challenger 8.1% rating and arrive at the number of 11' Challenger

*/ Channel Master and Winegard are the most notable 'exceptions' to this analysis. Their respective 'percentages of penetration' do not compute properly if you accept their own shipment numbers as accurate. There are several logical explanations for this since both firms

use distribution methods largely built-upon creating 'captive' dealer networks. Others who fall into the same 'captive dealer' syndrome are Birdview, Conifer, General Instruments, dealers for Long's Electronics, and to a lesser extent USS/Maspro.

antennas sold that month. That computation requires knowing HOW MANY antennas of each model a typical dealer would sell per month. This is a measurement of 'lines-carried for resale' only.)

A total of 73 different antenna models representing 48 different antenna brands turned up in the survey reports.

FEEDS Handled

Thirteen (13) different feed models were mentioned by dealers with many dealers (92%) handling more than one model (or brand); the typical dealer handles 1.77 feed models. There are few surprises

- 1) Chaparral Polarotor 2 / 41.18%
- 2) Chaparral Polarotor 1 / 22.35%
- Omni-Spectra Polarizer / 11.77%
- 'Chaparral' (no model specified) / 7.2%
- 5) Boman '1' / 5.2%
- 6) Boman '2' / 4.9%

The seven remaining brands/models accounted for 18.8% of the total 'mentions,' or less than 2.6% 'each.'

MOUNTS Handled

We asked dealers to tell us about the antenna mounts they used in their installations PROVIDED they bought or acquired the mounts SEPARATE FROM the supplier of the antenna proper. What we found is that most dealers (66.7%) do NOT buy mounts separate from antennas, and of those that do not buy mounts and antennas together, 25.0% fabricate their own mounts 'in house' (i.e. either in their own shops, or, by using a local-to-them shop to fabricate the mounts).

This is not very surprising; South River's Roy Cohn (one of the industry's most talented mount fabricators) once remarked to us that he sells many mounts 'one at a time' to dealers; he believes they order 'one' to see 'how it is done' and then use the South River product as a 'model' for local fabrication nearby. Such are the practical problems for a stand-alone mount designer and manufacturer in our industry today!

LNAs Handled

There was a surprise or two in the LNA lines currently being handled/pushed by dealers. In our 1983 survey, Avantek was the most frequently handled 'brand' (it still is) and Amplica was second. Amplica has dropped into position 4 in 1984; a more detailed analysis appears in our '1984 CSD TVRO Marketing Book.' Keep this next set of numbers in mind as we come back to LNAs later in this report and dealers tell us how they RATE (for performance, reliability, and warranty backup) the various LNA suppliers.

- 1) Avantek / 43.7% (38% in 1983)
- Drake / 19.6% (no product 1983)
 California Amplifier / 18.6% (insignificant 1983)
 Amplica / 11.8% (21% in 1983)
- LOCOM / 9.9% (insignificant 1983) 5)
- MSE/MSM / 9.6% (no product 1983)
- 7) M/A COM / 8.9% (insignificant 1983)
- 8) SPACEvision / 5.1% (no product 1983)
- Dexcel / 3.8% (insignificant 1983)
- 10) NORSAT / 3.1% (no product 1983)
- 11) Winegard / 2.8% (no product 1983)

In addition to these brands mentioned, we had five other brands also reported; none with more than 1% 'mention.

RECEIVERS Handled

Again, some changes from the 1983 survey results. Dealers in 1983 rated receivers based upon top performance, warranty repair and backup. This year we have two receiver categories; the receivers actually carried by dealers (here), and, for overall (superior or less) performance. Here is how dealers align for handling various receiver

- 1) R.L. Drake Co. / 27.8% (#1 in 1983 as well; 18%)
 - A) Model ESR-240 / 14.57%
 - B) Model ESR 324 / 12.58%
- 2) KLM / 12.5% (#4 in 1983; 10%)
 - A) Model IV / 5.30%
 - B) Model V / 2.65%
 - C) All other models / 4.64%
- 3) LUXOR / 8.6% (#5 in 1983; 7%)



- A) Model 9550 / 6.6%
- B) Model Skantic MK. 1 / 1.3%
- C) Model 9540 / 0.7%
- 4) Automation Techniques / 8.0% (#2 in 1983; 11%)
 - A) GLR 500 / 3.31%
 - B) GLR 560 / 1.99%
 - C) Other Models / 2.65%
- 5) Dexcel (3 models) / 4.64% (not rated 1983)
- Intersat (3 models) / 4.52% (not rated 1983)
- Sat-Tec (2 models) / 3.98% (#8, 5% 1983)
- 8) AVCOM (2 models) / 3.37% (#6, 5% 1983)
- 9) Channel Master (2 models) / 3.26% (not rated 1983)
- 10) Astron AR-110 / 3.15% (not available 1983)

In all, there were 29 receiver brands and 48 different receiver models mentioned on dealer survey forms.

MODULATORS Carried

Only 37.5% of the dealers handle outboard modulators and some of these carry the external modulator package made by their receiver supplier. We found 13 different modulator brands representing 16 different models in the returned survey forms. These were the leaders:

- 1) R.L. Drake / 18.52%
- JJT RF3400 / 11.30%
- 3) Transifier (Pico) (50X) / 11.10%
- 4) UHF Associates / 10.90%
- 5) Blonder Tongue (AVMT) / 7.40%

STEREO PROCESSORS Carried

Slightly less than half of the dealers carry or offer in their lines a stand-alone stereo processor package for home TVROs. There were three brand names and 4 models mentioned, as follows:

- 1) R.L. Drake SA-24 / 69.6%
- Arunta SSP318 and SSP316 / 26.10%
- 3) USS/Maspro / 4.4%

\$2,600 (installed) Package/ Illinois:

Paraclipse 12', Drake 100° LNA, Drake 240, Chaparral P1, MTI 2800 drive.

\$2,995 (installed) Package/ Northern California:

10-1/2' Hastings, Cal-Amp 100° LNA, Chaparral P1, TDF Eclipse 1 drive, GLR-520 or Gillaspie 9600 re-

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Hoosier Electronics (812) 238-1456 (800) 457-3330

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Starpath Sys. (606) 276-4435 (502) 343-3898

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South Carolina

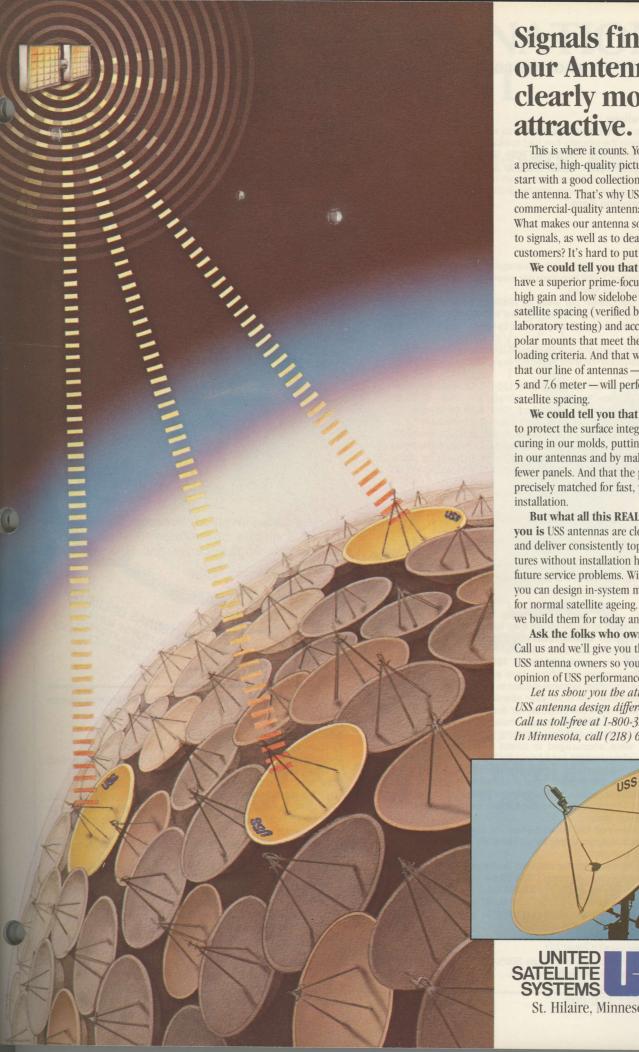
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Ask the folks who own one. Call us and we'll give you the names of USS antenna owners so you can get their opinion of USS performance firsthand.

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DEALER Operations

The dealer's individual profiles provide us with the first substantial measurement tools the industry has had available. We asked dealers 25 'substantial questions' concerning **how they run their shops**, what they charge for systems, and how their sales are going (or they forecast will go). The amount of data shown here hits only the highlights from the responses; a more detailed profile appears in the '1984 CSD TVRO Marketing Book.'

Dealer Stats

Systems Sold:

We have already reported that the average of all dealers reporting has been recorded as 1.358 terminals per week (during calendar year 1983). The detail is as follows:

- 1) Average per dealer/ per week in 1983: 1.358 terminals
- 2) Highest per dealer per week reported in 1983: 6.04 terminals
- 3) Lowest per dealer per week reported in 1983: 0.0769 terminals per week.

April 1984 was a specific month studied, primarily because it was the last complete month nearest to the survey period (May 01 to May 31 deadline).

- Average per dealer/per week April 1984: 2.13 terminals (percentage increase from 52 week average for 1983 = 57.85%)
- 2) Highest per dealer per week April 1984: 8.09 terminals
- 3) Lowest per dealer per week April 1984: 0.2 terminals

May 1984 was selected as a 'forecast month' because it was the month which dealers were 'in' when the reporting forms were being completed, and because it would give us a 'two-month-run' on statistics in a 'normal' (i.e. not high sales nor normally low sales period) 60 day span.

- Average (forecast) per dealer/ per week May 1984: 2.70 terminals
- Highest per dealer per week (forecast) May 1984: 11.63 per week
- Lowest per dealer per week (forecast) May 1984: 0.4 per week.

The average of all dealers was calling for a per-week average by the end of May of 198.8% of the average per week for the 52 week period of 1983.

Average Price

We asked dealers to detail for us their typical equipment packages, and to reveal their 'asking retail price' for that terminal system. We received more than 200 such 'terminal-mix-packages' and the most interesting of these are detailed in the '1984 CSD TVRO Marketing Book.' A few samples are shown here as well.

The average (installed) terminal system in the industry today sells for \$2,990.56. However, we draw your attention to the following:

- We provided room (on purpose) for dealers to list the component parts for a SINGLE system (most will offer two or more different systems at different pricing levels, of course).
- 2) Dealers were encouraged to select a 'middle-of-the-road' package of equipment (and price) for their completion of this question. The lowest package price reported was \$2,000 (installed) while the highest price reported was \$5,500 (also installed). Conspicuous by absence are 'cheap systems' using 4 to 6 foot dishes retailing, installed, in the (perhaps well) under \$2,000 price class.

(Since our views on too-small dishes are already well known, we will pass up this opportunity to 'editorialize' on the subject!).

The straight statistics:

- 1) Average re-sale price for installed package / \$2990.56
- 2) Highest retail price reported / \$5,500.00
- 3) Lowest retail price reported / \$2,000.00.

We also asked dealers to assign a 'forecast value' to what they expected their dealerships to 'do' during calendar year 1984. We had the following numbers surface:

- Average dealership will experience an increase in retail sales of 73.70% (over 1983);
- 2) Highest increase projected was 300%.
- 3) Lowest increase projected was 4%.

How Are Dealers Structured?

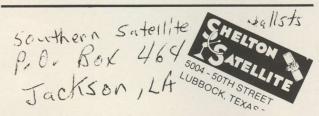
We offered three options and found the following 'legal status' for dealers:

- 1) Single proprietorship / 56.25%
- 2) Corporation 22.92%
- 3) Partnership 20.80%

How Are Dealers Equipped?

We were concerned here with the number of employees per dealer, the number of dedicated vehicles (i.e. vehicles that would not be in service if they were NOT in the TVRO business), and whether they had (and how they used) a trailer-mount dish system. The numbers:

- 1) Average number of employees / 3.53 people (including owner)
- 2) Highest number of employees / 17
- 3) Lowest number of employees (0, an 'honest statement' that not even the owner 'makes a living' from the business; yet).
- In the vehicle department:
- Average number of dedicated vehicles (i.e. vehicles used FOR the business) / 1.43
- 2) Highest number of vehicles / 4
- 3) Lowest number of vehicles / 0.
- In the trailer/mounted antenna department:



\$3,300 (Canadian/installed) Package/ Manitoba:

D&H 9' spun dish, SpaceVision 100° LNA, EHF 75 feed, Gillaspie 9600 receiver and Gillaspie 8200 actuator/drive.



- Do have one (or more) trailer mounted TVRO antenna systems / 77.08%
- 2) Do not have / 16.67%.

And how the trailer mounted rigs are used:

- 1) Used for site testing/demonstrations / 83.8%
- Used (in some cases ALSO to testing) for downlinking contract work / 32.4%.

More detail on the trailer mounted rigs:

- Of those 32.4% with trailer rigs who expect to do downlink jobs in 1984, the 'average anticipation' is for 6.92 downlinking jobs in the 12 month period. The lowest number 'anticipated' was 2; the highest was 25.
- Certain types of antennas have been chosen for trailer mounted rigs.
 - A) Paraclipse 9' / chosen by 18.92% of those using trailermounted rigs;
 - B) Paraclipse 12' / chosen by 16.2% of those with trailer rigs.
 - C) Prodelin 10' / chosen by 16.1% of those with trailer rigs;
 - D) Odom 10' / chosen by 5.8% of those with trailer rigs;
 - E) D&H 9' / chosen by 5.2% of those with trailer rigs.

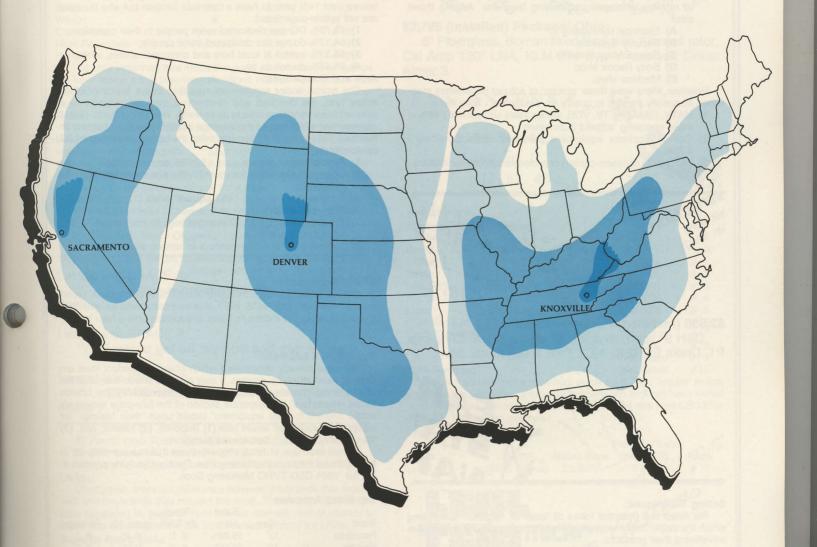
There were 21 different antennas 'mentioned' for trailer mounted rig use

Business Operations

Much has been written, and said, about the types of operation one

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finds in the TVRO arena. Our survey tells us that **REAL dealers** in the TVRO world are quite competent business people with an excellent understanding of how they meet their customers and help their businesses grow. For example:

- 63.64% of the REAL dealers operate their TVRO business as a 'stand-alone' business (i.e. not as a 'sideline' to another business):
- 2) 36.36% operate the business as an adjunct to some other type of retailing/wholesale/contracting business. Among those cited:
 - A) Electrical contracting
 - B) Security Systems
 - C) Solar Energy systems
 - D) Body Repair shop
 - E) Machine shop.

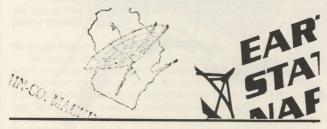
However, there were three 'groups' of adjunct businesses mentioned frequently enough to qualify as 'categories.' They were:

- MATV, (SMATV), TV, VCR, stereo sales and service / 44% of those operating 'adjunct businesses';
- Communications equipment (two-way radio) servicing / 4.70%;
- RCC (radio common-carrier) or professional communications / 4.3%.



\$2,650 (installed) Package/ Kansas:

D&H 9' spun, Avantek 48 dB 120 LNA, Chaparral P1, Drake ESR240, HC1 Pilot 1/45A motor drive.



Selling Techniques:

We listed five potential forms of 'local' or 'regional' advertising which the dealer might engage in. Here is how we found dealers are advertising their products:

- 1) Newspaper advertising / practiced by 85.42% of all dealers
- 2) Yellow-page advertising / practiced by 58.33% of all dealers (Note: this means however that 41.67% of all dealers could NOT be located if you combed all of the nation's yellow page directories!)
- 3) Direct-mail advertising / practiced by 41.6% of all dealers
- 4) Radio advertising / practiced by 37.5% of all dealers
- 5) Television advertising / practiced by 2.4% of all dealers.

OEMs and distributors should study these numbers carefully when laying out 'co-op' advertising programs. By tailoring dealer-level co-op advertising for maximum effectiveness where the dealers are already spending money, both OEMs and dealers alike can get better mileage from advertising dollars spent.

Another favorite topic amongst dealers is dedicated sales people. Do you make more money by putting selling-only people to work to run the display center of the operation?

We found, first of all, the following about dealerships maintaining full time 'shops' or stores for TVRO system sales:

1) 72.34% DO maintain a regular commercial place of business

with regular (posted) store operating hours;

And, 27.66% do not maintain an identifiable place of business.

We have to draw your attention to the 27.66% that do **not maintain** a regular 'store/shop' and the 41.67% who do **not place** their business in the local yellow pages. It is somewhat understandable that those who operate from their 'homes' (the 27.66% not maintaining a business location) might not be listed in the yellow pages; but that still leaves over 14% who do have a business location but who (to date) are not yellow-page listed.

- 1) 43.75% DO use dedicated sales people in their operation;
- 2) 54.17% do not use dedicated sales people;
- 3) 58.33% exhibit at local fairs and consumer shows, while,
- 4) 34.42% do not do so.

Area and Competition:

The typical dealer services an area that has a radius of **66.41 miles** (yes, we checked and re-checked that computation as it seemed like a very large area to us as well!). That works out to 13,855 square miles which tells us the 'average dealer' spends a lot of time on the road! Within that 13,855 square miles the typical dealer has **14.23 competitors**.

- 1) Typical dealer service area / 13,855 square miles
- Largest dealer service area / 125,664 square miles (200 mile radius)
- Smallest service area / 452 square miles (12 mile radius).
 And the competition:
- Typical dealer has 14.23 competitors (in his 'typical' 13,855 square mile area)
- 2) Largest number of competitors in service area / 100 (+)
- 3) Smallest number of competitors (0; no, we won't tell you who has a 'lock' on a service region!).

SPACE Participation

We have already noted that 'less than 30% of the dealers' report they are members of SPACE. We'll save their comments for 'why' they do not belong to the industry's trade association until a later report.

SUPERIOR Equipment

We have already determined which brand or product lines are carried most often by dealers. It may surprise you to learn that the brands 'most frequently carried' are not necessarily the brands 'most respected.' In a separate section of the five-page survey we asked dealers to 'rate equipment' based upon 'their feelings' for equipment which they would rate (1) Superior, (2) Inferior, and, (3) 'Never carry again . . . because of problems . . .".

We will deal here, in detail, only with those that 'made the top-10' in the important measurement categories. Detailed analysis appears in the full '1984 CSD TVRO Marketing Book.'

Top Rated Antennas

		Rated	Rated		
Brand	Size	Here	By Sales	(page 12)	Ranking
Paraclipse	12'	26.98%	# 1/	35.4%	# 1
Prodelin	10'	20.65%	# 2/	31.0%	# 2
Paraclipse	9'	9.52%	# 3/	18.8%	# 3
Odom	10'	6.40%	#12/	6.1%	# 4
Intersat Challenger	11'	6.3 %	# 9/	8.1%	# 5
ADM	11'	6.15%	#11/	6.3%	# 6
ECI	11'	6.05%	Not Rated		# 7
Janiel Dark Star	10'/12/	4.80%	# 5, 6	16.5%	# 8
D&H Spun	9'	4.65%	# 4	16.9%	# 9
Hastings PF12	12'	3.25%	Not Rated	_	#10
Commander Spun	8'	3.15%	Not Rated		#11
Winegard	10'	3.05%	Not Rated	_	#12

Note that while the ECI 11 foot, the Hastings 12 foot, the Commander 8' spun and the Winegard (SC-1018) did not rate in the top 13 for antennas **carried and 'sold'** by dealers, they did rate in the 'top 12' for antennas **respected by** dealers.

The opposite of respect is dis-respect and we have an interesting line-up of 'Rodney Dangerfield Specials' which dealers have little good to say about. Here is how this group rated:



Least Respected **Antennas** Size Rated Here Ranking Janiel Dark Star 25.8 % all sizes # 'All 4-piece fiberglass' 12.9 % # 2 10' All Fiberglass 10' 9.70% # 3 All Mesh Various 9.55% # 4 Most Mesh Various 9.30% Wilson 6.90% 11' # 6 Wilson 9' 6.25% Continental Various 5.60% Most Fiberglass Various 5.25% 11' 5.15% #10

The only antennas that made the good and not-so-good listings are from Janiel; a true love-hate situation!! We had 40 antennas that made it onto the 'inferior' list but most only got 'mentioned' a time or

Feeds:

The liked and disliked feed survey was a virtual carbon-copy of the brands-carried listing. Just over 5% of the dealers responding took the time to pen in something like ". . . have never had any REAL problems with the (name of brand) so have seen no reason to TRY another! .". Since one brand does virtually dominate the marketplace, this of course makes it especially difficult for a newcomer to break into the feed business.

- 1) Most liked feed / Chaparral (no model number) by 38.46%
- Second most liked / Chaparral Polarotor 1 / 23.1%
- 3) Third most liked / Chaparral Polarotor 2 / 16.95%

I would join SPACE if:

"... it better represented my interests as a dealer . . . ".

I would join SPACE if:

"... I would get off my butt and pay my dues!"

I would join SPACE if:

"... SPACE was paying more attention to the dealer . . . ".

- 4) Fourth most liked / Omni-Spectra Polarizer / 12.31%
- 5) Fifth most liked / Seavey / 4.55%.
- Other mentions (totaling under 6.5%) for Luly, SRS and Boman. LNAs:

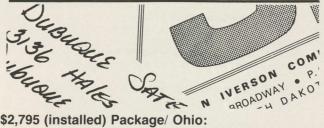
Once again, there is a difference between the brands that dealers 'sell' and the brands they respect the most. The differences with the table appearing on page 13 here are not dramatic, but of interest to those who must figure out the best marketing plans for LNAs.

Superior Rated LNAs

		Rating by Sales	
Brand	Rating Here	(Page 13)	Rank
Avantek	21.80%	43.7%	# 1
Drake	19.55%	19.6%	# 2
Amplica	12.64%	11.8%	# 3
Dexcel	6.90%	3.8%	# 4
Cal Amp	6.75%	18.6%	# 5
M/A Com	5.85%	8.9%	# 6
MSE 40 dB	4.62%	9.6%	# 7
Norsat	4.55%	3.1%	# 8
LOCOM	3.50%	9.9%	# 9
SpaceVision	3.45%	5.1%	#10

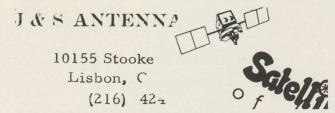
A total of 18 brands were mentioned in the LNA field; bet you didn't know there are that many around!

There were 45 different receiver models earning '1% mention or more' by dealers. Of those, 35 fell in the below-3% region but above 1% mention. Yes, there are alot of receivers out there as well, vying for



\$2,795 (installed) Package/ Ohio:

8' Fiberglass, Boman fixed feed with Alliance rotor, Cal Amp 100° LNA, KLM Sky Eye V receiver, Draco Aimer 3.



your attention.

Superior Rated Receivers

		Rated By Sales		
Brand	Model	Rated Here	(page 13)	Rank
Drake	ESR-240	16.70%	14.57%	# 1
Drake	ESR-324	12.98%	12.58%	# 2
AutoTech	(several)	8.35%	8.00%	# 3
Avcom	2A, 2B	7.40%	3.37%	# 4
Luxor	(3 models)	5.55%	8.60%	# 5
KLM Sky Eye	(IV)	4.62%	5.30%	# 6
Earth Terminals	_	3.72%	Not Rated	# 7
Dexcel	(3 models)	3.68%	4.64%	# 8
DX	642	3.64%	Not Rated	# 9
KLM Olympiad	-	3.60%	Not Rated	#10

The not so well rated receivers come next. The 'leader' in this unfortunate category is Luxor, and the Swedish firm has been mixed up in quite a distribution 'mess' for several months now (see CSD/2 for June 15, 1984 as an example).

Least Respected Receivers

			Rated By Sales	3
Brand	Model	Rated Here	(page XX)	Rank
Luxor	(9500 Series)	20.89%	8.6 %	# 1



\$4,500 (installed) Package/ Florida:

12' Paraclipse, 80° Avantek LNA, Omni Spectra feed, General Instruments CRHF receiver, with motor drive.



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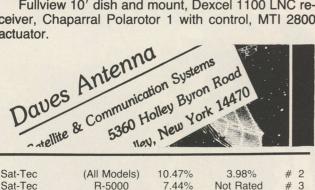
Airpatch Avionics Defuniak Springs, Florida 904-892-7787 Alpha-Omega Idabel, Oklahoma 405-286-7116 Anderson Scientific, Inc. Rapid City, South Dakota 605-341-3781 Anderson Scientific (Canada), Ltd. Surrey, British Columbia, Canada 604-533-4757 Delta Satellite Cedarburg, Wisconsin 414-375-1000 Halvorson Distributing Yankton, South Dakota 605-665-1240 K & M Resources Mathis, Texas 512-547-3278 Long's Electronics Birmingham, Alabama 1-800-633-4984 National Micro-Dynamics Chattanooga, Tennessee 615-892-8901 Nedce St. Laurent, Quebec, Canada 514-341-3700 (Montreal) Odom Antennas, Inc. Beebe, Arkansas 501-882-6485 O'Rourke Brothers Distributing North English, Iowa 319-664-3768 G.M. Popkey Green Bay, Wisconsin 414-437-5445 Satellite Engineering Scarborough, Ontario, Canada 416-292-9500 Satellite TV Specialists Salt Lake City, Utah 801-262-8813 Starview of Texas Dallas, Texas 214-934-9126 Symtel Albuquerque, New Mexico 505-345-4584 Teknasat Stockton, California 209-464-5870 Transvision Corporation Greenbrae, California 415-924-6963 Video Electronics Louisville, Kentucky 502-969-1810 Video Signals Wallisville, Texas 409-389-2214





\$3,250 (installed) Package/ Texas:

Fullview 10' dish and mount, Dexcel 1100 LNC receiver, Chaparral Polarotor 1 with control, MTI 2800 actuator.



Sat-Tec	(All Models)	10.47%	3.98%	# 2
Sat-Tec	R-5000	7.44%	Not Rated	# 3
KLM	(All Models)	5.98%	12.50%	# 4
Wilson	YM Series	5.91%	Not Rated	# 5
S.V.S.	_	4.48%	Not Rated	# 6
Astron	AR 110	3.04%	3.15%	# 7
Gillaspie	9600	3.00%	Not Rated	# 8
Janiel	- 2	2.98%	Not Rated	# 9
AutoTech	(All Models)	2.95%	8.0 %	#10

Additionally, there were 22 other brands/models mentioned with more than a '1% Disrespect Rate.'

ACTUATORS Revisited

During our 1983 survey, most dealers felt that the motor drive plus controller segment of the typical home system was the most troublesome part of the system. Two things have happened here in the past year:

- 1) Two firms have surged into the lead, grabbing between them a significant 'market share' (we measure it at 69.8% for the two firms):
- 2) Both are also highly ranked for their warranty/repair service turn around, indicating that not only are they moving substan-

SERVICE Satellite TV **EARTH STATIONS**

\$2,595 (installed) Package/ Oregon:

11 foot (no brand given) fiberglass antenna, Dexcel 1200 LNC receiver, Chaparral Polarotor 1.



tial numbers but that their repair departments are managing to keep up with the product flow.

There is, in a nutshell, a dramatic turn-around in the actuator world on this survey and it is a positive turn-around at that. First the 'most respected' (as in 'Superior Rated') actuator story.

Superior Rated Actuators

		% VVNO	% VVNO	
Brand	Model	Sell	'Endorse'	Ranking
MTI	2100	11.57%	25.64%	#1
MTI	2800	17.36%	23.08%	#2
Houston Tracker	(4 Models)	30.56%	21.80%	#3
Luxor	9534	4.05%	5.13%	#4
Draco Aimer	III	Under 1.0 %	3.80%	#5
Draco Aimer		Under 1.0 %	2.65%	#6
HC-1 Pilot	_	6.50%	2.55%	#7

Note that we are combining BOTH categories here: reports from dealers on the brands/models sold (first percentage column) and the degree of satisfaction of dealers with those units. Again, this is such a dramatic turn around from 1983's survey (although Houston Tracker did rate well then as well; just not-as-well!) that we found the results significant.

In the least popular (i.e. least respected or 'inferior') lines we almost have too little data to make up a representative 'table.' The most-ill-thought-of actuator is no longer in production; the fabled ADEC unit that gathered a '100% negative response' back in the 1983 survey. The number two unit in the 'not-so-good' family was the Tel-Vi; again, no longer in production. After that we had MTI (5.4% mentions), Arc-Finder (5.2% mentions), Eclipse (5.1% mentions), Apollo (4.85% mentions) and finally Skywalker (4.20% mentions). Dare we hope that the world of ill-working and poorly 'supported' actuators is a thing of the past?

WARRANTY and Repairs

It was the incredible response from dealers during the 1983 survey which led us to the conclusion that 'something MUST be done' to help the dealers get better service backup. Our in-print suggestion led first to the SFPC 'warranty program' and later to the SFPC 'financing program.' That was a direct result; there were perhaps far more intangible results, which ultimately will have a far greater impact on the steady growth of the industry.

We asked dealers to rate the 'warranty/repair situation' for us; 1984 versus one year ago. Here are the results:

- 1) Warranty/repair is SOME better than one year ago / 35.42%
- 2) Warranty/repair is NO better than one year ago / 29.17%
- 3) Warranty/repair is MUCH better than one year ago / 6.2%

4) Dealer did not answer the question / 29.20%

Are things really better? We think so. Is the warranty and repair process perfected? Not yet. It is a pity that OEMs (and distributors) cannot be FORCED to sit down and read the dealer comments on our survey forms. It is extremely obvious to us that when an OEM or distributor takes care of (as in promptly servicing equipment for) dealers, he KEEPS that dealer as a customer. Want proof of that?

The number one-rated and ranked seller of receivers; R.L. Drake. The number two seller of LNAs? R.L. Drake. The number one seller of modulators? R.L. Drake. The number one seller of stereo processors? R.L. Drake.

And the highest ranked firm for warranty repair? Need you ask? R.L. Drake.

Dealers return to buy from suppliers who stand behind their equipment, are helpful to dealers with problems, and who 'care' that repaired equipment turns around promptly.

We asked dealers to tell us 'whom they look to' for warranty and repair work. Here is what we found out:

- 1) Look to original equipment manufacturer (OEM) / 56.50%
- 2) Look to the distributor purchased from / 45.81%
- 3) Look to internal repair facilities / 4.1%

You already know that dealers rank R.L. Drake as the 'best' for warranty and repair service. How does that 'list' shape up?

manufaction to the state of the		
Rated Here	Rank	
19.64%	#1	
8.90%	#2	
3.60%	#3	
	Rated Here 19.64% 8.90%	



OOP'S SATELLITE DIGEST PAGE 23/CSD/7-84

BR Satellite	3.56%	#4
Satellite TV Systems	3.50%	#5
KLM	3.42%	#6
Houston Tracker	3.35%	#7
DI		

Plus, there were 32 other firms (over half are distributors) who rated in the 'over-1%' region.

And the 'Worst Warranty' service? Unfortunately, somebody has to be tagged with this title. Here is how they shape up:

to the thing of apo ap	
Rated Here	Rank
10.55%	#1
7.90%	#2
7.86%	#3
7.83%	#4
7.76%	#5
5.25%	#6
	Rated Here 10.55% 7.90% 7.86% 7.83% 7.76%

It is to be noted that Automation Techniques (AutoTech) often ends up in both ends of a 'good/bad' listing. Under warranty, for example, they are rated as 'third best' and 'sixth worst.' In the 'most respected receiver' department they rate third, right behind the two top selling Drake models. Yet they also end up being rated as the tenth receiver in the least desirable listing. Looking back on the 1983 survey results, we find that precisely 50% of their rating was 'positive' in 1983, and, 50% was negative. It will be interesting to see if they can get a handle on the negative half of their operation between now and the 1985 survey!

WHO Do We Buy From?

It should surprise no-one that the majority of the dealers buy their goods from one or more distributors. However, that only 52.08% of dealers taking place in the survey do use a distributor as their major source may open a few eyes. OEMs accounted for 27.10% and another 20.82% simply did not complete the question.

Hoosier and Echosphere (all three locations combined) tied for top spot as distributor sources while StarCom, Delta Satellite, IVC, D&H (distribution), High Frontier, Satellite TV Specialists and Satellite TV Systems (S.C.) all ranked in the 3% and over region with dealers. Many dealers listed multiple sources for equipment.

FINANCING Of TVROS

One year ago, financing (consumer financing) of TVROs was virtually impossible. That prompted the formation of SFPC and their November 1983 'roll out' of their financing package. This, in turn, apparently caused many dealers to pay a visit to local financing institutions. What we now have is a dramatically changed, and positive, 'financing climate' for home TVROs at the consumer level. Our findings

- 1) Those who do now offer customers financing for TVROs / 77.08%
- 2) Those who do not offer financing / 16.65%
- 3) Those who did not answer question / 6.30%
- And the sources for financing:
- 1) Local banks / 50.0%
- Local Finance Firms / 31.2%
- 3) SFPC-Satellite Financial Planning Corp. / 33.0%

Now, what does financing do for a dealer? We were surprised to find that the most significant portion of the dealers responding found financing assisted them in selling TVROs in a disappointing percentage of the sales. Here is how that shaped up:

Financing accounts for this percentage of our sales:

- A) Less than 10% / 37.84%
- Between 10 and 19% / 17.95%
- C) Between 20 and 29% / 15.40%
- Between 30 and 39% / 7.70%
- E) Between 40 and 49% / 10.15%
- Between 50 and 59% / 2.55%
- G) 60% and above / 10.30%

It is worth noting that one of the largest dealers (\$1,700,000 annual sales for 1984) reported 80% of his system sales are financed.

HOW Dealers Warranty Systems

Most equipment manufacturers now have relatively long period warranties (such as one year) on the equipment they sell to dealers. Dealers logically pass that warranty to the consumers as well. We asked dealers how they stand behind their installations and here is what we found out:

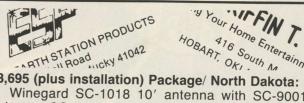
- 1) 90 day complete guarantee / 25% (including some that warrant the electronics for one year and their labor for 90 days);
- 180 days / 2.0%
- 12 months / 72.2%
- 4) More than 12 months / 0.8%.

Additionally, 16.5% of the dealers offer an additional one-year warranty package for an optional fee; another 18.5% offer a three year option (including one that offers a 3-year guarantee on Paraclipse antennas sold) and 10.4% offer a five-year warranty program (including some offering the BR Satellite five-year program).

AND Zoning

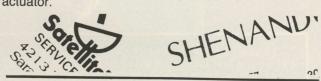
Much has been made of the issue of 'zoning.' A considerable amount of time, and one suspects money, has been expended on battling zoning ordinances (real, and imagined) throughout the U.S. Just how real is the zoning threat?

Our own calculations tell us that we have approximately 6.8% of the REAL dealers participating in this year's survey. We found 3.13% of the dealers surveyed had knowledge of one or more communities (inside of their service areas) where some form of anti-TVRO zoning, or special use permit, existed. We identified 13 communities with some type of restrictive regulation and if you assume those 13 communities represent 6.8% of the existing communities with such restrictions, you come to the mathematical deduction that there may be as



\$3,695 (plus installation) Package/ North Dakota:

Winegard SC-1018 10' antenna with SC-9001 Polarotor, SC-8101 100° LNA, SC-70355 receiver with actuator control and modulator built-in, SC-7055 actuator.



many as 191 such communities nationwide; not an insignificant number.

Those identified are as follows:

Colorado/

Genessee

Lake Arbor

Illinois

Galena

Michigan

Ada

Kentwood

Rockford **New York**

Pelham (special tax)

Irondequoit

Parma

Perrington

Pennsylvania

Baldwin

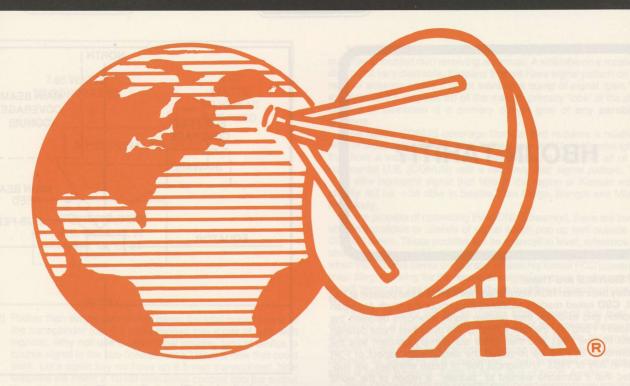
Pittsburgh

Wisconsin

Wisconsin Rapids

If our assumption that there are more than 175 'other such communities' is correct, we encourage dealers who are aware of communities NOT on this brief list to drop a note to CSD so that a more complete and more accurate listing can be completed for our own self-protection.





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HBO IN TAHITI?

THE SIGNALS Are There!

Way back when RCA first placed their F3R bird into position at 132 west, CSD asked readers scattered throughout the North American reception grid to check their relative signal strengths between the replaced F1 bird and the new F3R bird. We published those detailed results in April 1981 and then since our primary concern was the performance of F3R we re-visited the degradation aspect of F3R again in July of 1983. Throughout both of those analyses, we suggested that if someone wanted to "pioneer" a region of the world where satellite television had not yet reached, attention should be focused on that area in the Pacific along and west of the coast of Central/South America to the west perhaps as far as the 'International Date Line.'

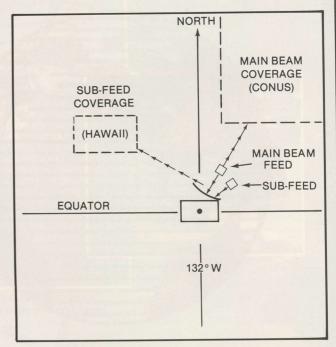
What many may not realize about this portion of the world is that while we are describing a considerable region of the world, we find very few real potential viewers (read 'TVRO system sales') here. An example that is familiar to most of us; the airplane flight from Los Angeles to Hawaii is over 2,000 miles. Between the two points there is no land; which means no people, no potential TVRO sales. The same 'size' area would virtually 'cover' the whole of the United States. Obviously if there are satellite signals 'spraying' over that water expanse, such signals are totally 'wasted.'

This is the primary reason why we see both (selected) Westar and Satcom birds (plus TelStar) designing into their systems 'spotbeam feeds' for special 'problem' locations such as Hawaii. The 'spotbeam concept' is not universal, but it is entirely economic based. An ex-

Hawaii represents a finite market for satellite service. Ideally, Hawaii would have access to all of the satellite services (read 'transponders') as the 'mainland' USA. The same could be said about Alaska and perhaps Puerto Rico. However, while the transmitting antennas on board the satellite could be re-shaped to accomplish this, there would be a great deal of signal 'wasted' between LA and Honolulu, Seattle and lower Alaska, Miami and Puerto Rico. The way around this is to design the transmit system on board the satellite so that only the desired 'sub-areas' (i.e. Hawaii, Alaska and Puerto Rico) are 'illuminated.' You do this by installing 'sub-feeds' on board the satellite, and placing those 'sub-feeds' in a position that they will squirt a 'narrow-beamed signal' back into the desired segment of earth. Then you connect those sub-feeds to the output portion of the transponder transmitters in such a way that only a (small) portion of the total available satellite 'power' ends up going into that particular sub-feed. Some numbers.

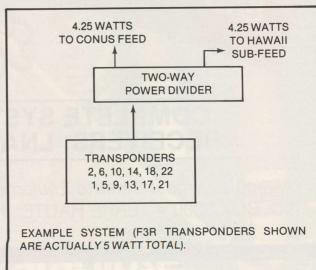
Let's say you decide that Hawaii requires a 30 dBw footprint signal on a bird that has the ability to place a 38 dBw signal into the boresight of the 'main beam.' This means you could design the Hawaii sub-feed so that it will be 8 dB weaker than the main beam (which we shall assume will point at the mainland or CONUS area). There are two ways to do this:

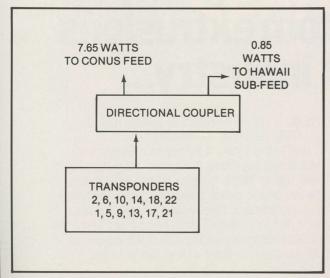
The total power available from the transponder (call it 8.5 watts) could be simply 'split' into two equal parts; 4.25 watts to each of two output ports. When you divide (in two) any power level (whether transmit or receive), you have a theoretical



'reduction by 3 dB'; or, half power. That means that automatically our 38 dBw main beam signal can now, at best, be 35 dBw. If you design the system in this fashion you could have 35 dBw mainland and the requested 30 dBw Hawaii spotbeam by simply reducing the pattern of the spotbeam antenna so that the resulting signal here is no more than 30 dBw. This will normally happen to you anyhow since one of the techniques used to create a spotbeam is to set the spotbeam transmitting antenna 'off to the side of' (rather than directly in front of) the transmitting reflector on the bird. Just as with any spherical or none-true-parabolic antenna, or indeed any 'parabolic' antenna, you can still realize 'some gain' and some efficiency even if the feed is not squarely in the primary 'focal point.' So by the time you end up with the mainland (CONUS) feed in the highest-gain spot of the reflector, and you have calculated the location for the spotbeam feed, you have been forced to accept a gain reduction of the spotbeam feed; even if you shared half of the total transponder-transmitter power (or, 4.25 watts in our example) with the spotbeam feed.

There is a 'better way,' and Ford did not invent it.





2) Rather than simply split (in two parts) the total output power of the transponder (i.e. 8.5 watts divided into a pair of 4.25 watt signals), why not use a 'directional coupler' type of device to couple signal to the sub-feed antenna? Here is how that could work. Let's again say we have an 8.5 watt transponder. Now suppose we insert a 10 dB directional coupler into the output line of the transponder. That means a signal 10 dB 'down' will appear at the coupler output. And, all of the rest of the signal will appear at the non-coupled output. For example. '10 dB down' is the same as taking 8.5 watts and getting 1/10th of that power at the coupled output. Or, 0.85 watts. Our 'loss' from the primary input signal, 8.5 watts, can be approximated by simple subtraction: 8.5 watts minus 0.85 watts or 7.65 watts 'remaining' at the non-coupled output

Now, rather than losing 3 dB from the mainland or CONUS beam by reducing the primary signal into a pair of equal parts, we can suffer approximately a 1.0 dB loss on the non-coupled output. In our original example we had the potential to be 38 dBw on the CONUS beam. Using this approach, our CONUS beam will end up being 37 dBw and we have 'saved' 2 dB in CONUS signal.

Naturally, the spotbeam does not fare as well. In our original example, we split the full 8.5 watt signal into a pair of equal parts. In our modified approach, using a directional coupler to create an 'uneven power split,' only a portion (10%) of the original 8.5 watt signal is available to the spotbeam service. And that is a 10 dB power reduction from the maximum signal available. Even connecting that 0.85 watt power level to the main beam (CONUS) signal would not result in a ground boresight signal greater than 28 dBw (i.e. 38 dBw original minus 10 dB reduction in level through the directional coupler). However, with the spotbeam signal typically being connected to an 'offset' feed antenna, using less than 100% of the full reflector efficiency, the spotbeam signal will be lower in level than 28 dBw.

One way around suffering such a 'drastic reduction' on the spotbeam signal is to design the feed so that the spotbeam illuminates only a relatively small area on the ground. The Hawaiian spotbeam(s) are a good example of this; the ground region to be covered is barely 300 miles in diameter and any boresight coverage beyond this distance is simply 'wasted' into the nearby Pacific ocean. So while this 'directional coupler' approach saves the mainland or CONUS boresight signal from unneeded signal reduction, the spotbeam region can still be adequately served by focusing the available power into a tightly confined region.

OFF AXIS Signals

All transmitting antennas, like all receiving antennas, have anamolies in their 'patterns.' The transmitting antennas utilized on board satellites are generally very 'tightly coupled'; that is, their aperture is quite small (because of the physical space limits on board the rocket and bird) and the feed selected has to accept some compromises. One of the compromises accepted is 'imperfect control of sidelobes.

You remember 'sidelobes' as they apply to the performance of our ground located dish receiving antennas. A sidelobe on a receiving dish is not very desirable; it means that we have signal pattern on the receive antenna where it is not wanted; a bump of signal 'gain,' for example, at 2.5 degrees off of the main or primary 'lobe' of the dish. Control of sidelobes is a primary design goal of any parabolic

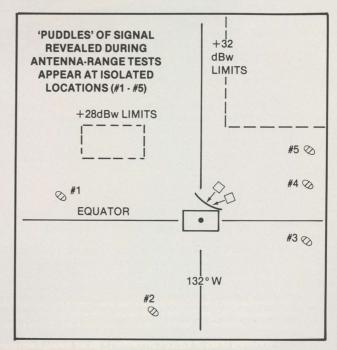
The typical CONUS coverage Domsat bird requires a relatively wide or broad 'main pattern'; that is, the beam must be wide enough so that from a location 24,000 plus miles away, it can 'see' all of the continental U.S. (CONUS) with a relatively 'flat' signal pattern. The +38 dBw boresight signal that falls in the region of Kansas would ideally still be +38 dBw in Seattle, San Diego, Bangor and Miami.

In the process of optimizing the CONUS beam(s), there are invariably little puddles or islands of signal which pop up well outside the CONUS beam. These puddles will be reduced in level, reference the strongest or boresight signal, by 10 or 12 or 15 (or more) dB. Now, when the satellite owner or operator makes his formal FCC (coverage map) filing, showing 'for the record' the signal contours for the satellite, he will 'eliminate' (as in leave-off) these puddles or islands of signals.

First of all, they will fall so distant from boresight that they are appearing in a region which is not a part of the intended coverage area. A puddle appearing over Tahiti in the South Pacific, for example, for F3R on one of the four transmit antennas on F3R, serves no 'useful purpose' as far as RCA is concerned. Their licensed-coverage region is North America. Tahiti is NOT part of North America.

Next, Domsat birds are 'coordinated' on an international basis with other Domsat birds as well as Intelsat birds. A 'true' pattern, showing every little 'signal puddle' might well cause some international repercussions. France, for example, as 'custodian' for Tahiti, could well 'object' to the U.S. or to international registry policemen if RCA boldly filed a 100% true and accurate pattern that displayed the F3R puddle over Tahiti. It might be difficult to defend the 'Domsat status' of F3R if you had puddles on the map over Tahiti, Caracas, Lima and segments of Chile.

For our interests, however, the exact information which RCA (et al) does NOT want 'shown' is the precise information WE want to know about. Needless to say, gaining access to the original 'satellite transmit antenna test range measurement results' is not a simple task. While the FCC filed maps, the 'clean versions' of the original test



HBO IN TAHITI/ continues on page 30

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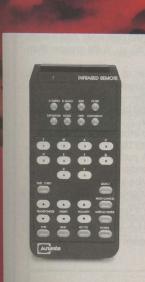
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HBO IN TAHITI/ continued from page 27

range maps, are readily available virtually for the asking, the engineering range measurements are not. There is another way to get the same information, but it is the hard way; **you go into the field** and **make TVRO antenna tests.** This is, still, a very big world and even hauling one of the 12 foot Luly 'umbrella' antennas from region to region would take a considerable amount of time, at considerable expense.

Gaining access to the original test range antenna plots, BEFORE they have been 'cleaned up' is obviously a crucial first-step to properly analyzing where you start to look for signals with a test antenna system. We had this opportunity, for the Intelsat and Galaxy series birds, more than one year ago. RCA, Westar and TelStar bird measurements are not as easy to 'locate'; but, not impossible to find.

NOT Strong

There are various engineering 'rules of thumb' practiced by the engineers who **translate** the test range measurements to 'clean footprint maps.' First they decide what signal level(s) are to be printed as 'minimum usable levels.' If the bird's maximum (boresight) signal is to be +36 dBw, a common 'minimum usable' number might be 12 dB below that level; or, +24 dBw. That allows them to simply 'discard' any puddles which appear from the test range measurements below +24 dBw (i.e. +23.99 dBw and below). From the 'clean map stage' onward, those levels below +24 dBw simply do not exist. Not as 'isolated puddles' at any rate.

Apparently, there are no real hard and fast rules as to where the line is to be drawn; i.e. 12 dB below boresight, 10 dB below boresight or some other 'convenient' number. The actual antenna test range numbers are only modestly useful **unless** you have access to the combining of the antenna pattern and a basic set of longitude and latitude coordinates, which the antenna pattern will 'lay over' in actual use. This involves knowing the precise boresight of the satellite's transmitting antenna, and how the satellite will stay locked into position in use. When you take all of this data (a custom computer graphics program helps in the initial set-up) you have the tools to portray the satellite's 'fringe' or non-boresight patterns in a useful format (i.e. against a map that depicts the 'real world').

The basic results are not for the faint of heart; you are not likely to stumble into a **30 dBw** signal in a 'signal puddle' 5,000 miles away from the boresight. That should suggest to you that you won't end up in an exotic spot with a 12 foot antenna producing (reasonably) high quality pictures. What you will do, armed with this knowledge, is get yourself into some regions of the world with some (read selective) North American Domsat signals where even one U.S./Canadian Domsat signal will probably sell a terminal. And, the terminal you sell will be **at least** a (high quality) 16 footer, and possibly bigger than that (since the unexpected 'signal puddles' are at best in the weak signal category).

When we read a standard, published, 'footprint map' we see that the strongest signals are at 'boresight' (the place on earth which the satellite focuses to) and as we go further and further from boresight, the signals progressively become weaker. Eventually you reach a point where signals have dropped from the boresight maximum in the +36 (and up) dBw region to levels in the lower portion of the 20's. Most people accept that once you drop below 23/25 dBw you are in trouble, even with high-grade 20 footers. A table appearing here relates dBw to antenna size, given certain system parameters (involving antenna noise temperature, receiver bandwidth, LNA noise temperature, etc.). **Most** 'signal puddles' **do not approach** 25 dBw although there are exceptions to this as we shall see.

The published (from FCC filed) footprint maps are useful because they provide us with some advance knowledge of how far down from boresight we might expect to find a signal in a given location. Most antenna pattern tests will take it a step further, all the way down to 0 dBw; which, surprise, is not the same as NO signal, Antenna pattern plots are done with ONLY the gain of the antenna proper calculated. To that number you must add the dB (decibels) greater than one watt of the transponder satellite itself.

For example . . . dBw means 'decibels ABOVE (or greater than) ONE watt.' A 38 dBw signal is one that is 38 dB stronger than a signal that is 1 watt in power (level), connected to a satellite transmitting

antenna which has $\bf 0$ dB of 'antenna gain.' If you connect a 30 dB gain satellite transmit antenna to a 1 watt satellite transmitter, you have 0 dBw satellite power (no watts **greater than** 1 watt) **plus** 30 dB of antenna gain (at boresight), **or**, +30 dBw of radiated (transmitted) power. So if the gain of the antenna can make the satellite signal 'stronger' on the ground, so too can the output **power** of the satellite itself.

8.0 WATTS POWER

1) 1 WATT (0dBw)

PLUS

3dB (2 WATTS) = 3dBw

PLUS

3dB (4 WATTS) = 6dBw

PLUS

4) 3dB (8 WATTS) = 9dBw

= TWICE + TWICE + TWICE (9dB)

For example, 2 watts of power is twice as strong as 1 watt; and that is a 3 dB (twice the power) increase. Or, 4 watts of power is twice-twice, or 3 plus 3, or, 6 dB stronger than one watt. And 8 watts is twice-twice-twice, or 3 (dB) + 3 (dB) + 3 (dB), or, 9 dB greater than one watt.

If the transmit antenna has a 'power gain' of 30 dB (at boresight), then the actual EIRP (effective/radiated power) is 30 dB plus the power gain of the transponder power amplifier — above the nominal 1 watt level. In our 8 watt example, we had 9 dB to 'add' so the example becomes a boresight EIRP of (+) 39 dBw.

As the table here shows, once you drop into the 23 dBw region, you are playing in the 'Intelsat Game' where big, accurate antennas and high grade equipment is mandatory. A puddle can appear in an area that is surrounded by signals in the 'under 10 dBw' region, or if you are fortunate, a puddle will show up in the 'teen region.' A typical puddle adds an area of perhaps 10 dB signal enhancement; a 9 becomes a 19 (rather abruptly) or a 14 may become a 24 (dBw). Puddles differ from a 'spotbeam' for two reasons:

 A spotbeam is an 'intentional' signal, illuminating an area (such as the Hawaiian Islands) where you want a 'measured' amount of signal.

+39dBw EIRP AT BORESIGHT

- 9dBw TRANSMITTER POWER (8 WATTS)

 PLUS
- 30dB GAIN (dBg) ANTENNA (AT BORESIGHT)
 OR,

39dBw

HOW BIG ANTENNA/ For What EIRP?

The size of the receiving antenna is a function of the following parameters: 1) Amount of satellite signal available (measured in dBw with more being better than less!), 2) the noise temperature of the TVRO system (a combination of the receive antenna noise temperature, the LNA noise temperature/figure, the receiver's downconverter noise figure/temperature), 3) the bandwidth of the transmissions and consequently the receiver which is intended to receive the transmissions. A full study of all of the variables is complex, but, certain quick-reference 'tables' and charts can be prepared to give you at least an idea of whether a system is likely to play (at all) or not, given your knowledge of at least the footprint signal strength. Footprint maps are often shown in either dBw (decibels of power in excess of one watt) or EIRP (the actual signal from the satellite which is equal to the power of the satellite PLUS the gain of the transmitting antenna; see text).

				0
dBw/EIRP Level	13', 60% E (*)	16', 60% E (*)	20', 60% E (*)	25', 60% E (*)
32 dBw	+2 dB	+4.5 dB	+6.5 dB	+8.4 dB
31 dBw	+1 dB	+3.5 dB	+5.5 dB	+7.4 dB
30 dBw	0 dB	+2.5 dB	+4.5 dB	+ 6.4 dB
29 dBw	-1 dB (**)	+1.5 dB	+3.5 dB	+5.4 dB
28 dBw	-2 dB (***)	+0.5 dB	+ 2.5 dB	+4.4 dB
27 dBw	-3 dB (****)	-0.5 dB	+ 1.5 dB	+3.4 dB
26 dBw	-4 dB (****)	-1.5 dB (***)	+ 0.5 dB	+ 2.4 dB
25 dBw	N/P	-2.5 dB (****)	-0.5 dB	+ 1.4 dB
24 dBw	N/P	-3.5 dB (*****)	-1.5 dB (***)	+0.4 dB
23 dBw	N/P	N/P	-2.5 dB (****)	-0.4 dB
22 dBw	N/P	N/P	-3.5 dB (****)	-1.4 dB (**)

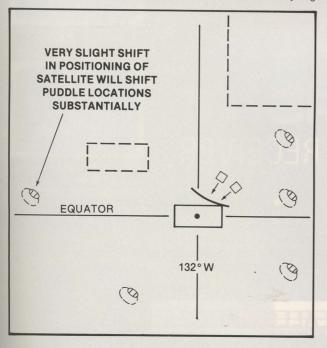
Notations:

It is assumed for ease of comparison that in each installation a 75 degree LNA is being used, a 26 MHz wide bandwidth (with a full transponder transmission) and a receiver with an 8 dB static threshold. Plus (i.e. + 2 dB) means you will be 2 dB 'over threshold' or the

- A 60% efficient antenna is assumed.
- 1 dB/ some sparklie noise in static scenes, but picture still high quality
- 2 dB/ slight noise in audio, sparklies evident in all scenes
- 3 dB/ moderate noise in audio, video has objectionable sparklies
- *****/ 4 dB/ color drops in and out, audio difficult to understand
- Not practical (below usable signal levels, even in black and white)
- 2) A puddle will appear, where it appears, largely inspite of the best efforts to eliminate it. Very small inaccuracies in the transmit antenna feed, the reflector surface, or the physical metal work of the satellite itself (surrounding the antenna) cause the 'abnormal puddles.'

PUDDLE Dangers

A puddle may have extremely sharp edge-skirts; in other words, you may have signal in one spot, and fall totally 'out of the beam' perhaps only 100 miles away. If your receiving location happens to be close to the spot where the puddle edge is located, a very slight



redeployment of the bird itself could cause you to lose signal. Remember that a bird drifts, on its own, in a box that is as a minumum 70 miles across (east/west, and, north/south). Each time the bird approaches (by drifting) the eastern (or western) edge of the box it is, by ground control and thrust rocket firing, sent back to the opposite edge of the box. Then it slowly drifts (drawn by landmass gravity) back to the opposite edge of the 'operating box.' When the thruster rockets are fired, there is some slight twisting of the bird possible which may or may not be noticed (i.e. monitored) within the boresight ground control region. However, a location close to a puddle-skirt-edge may see this normal(ized) bird deployment and station keeping as an abrupt change in signal levels (when you don't have THAT MUCH signal to begin with, a very small change can be very noticeable!). This, then, is a danger with 'puddle area terminals' and one not to be lightly dismissed.

HORIZON To Horizon Birds

The opposite of a bird that creates 'puddles' (i.e. F3R, F4, ANIK B and ANIK D are known 'puddle birds,' as we shall see) is a bird that seems to radiate signal from one visible horizon to the opposite visible horizon. The two Galaxy birds (G1 and G2) are a prime example of this class of 'international bird.

Intelsat birds are the accepted 'international grade' birds; G(h)orizont is another. Both Intelsat and Gorizont have (1) spotbeam, (2) hemispheric beam and (3) global beam patterns available. A spotbeam concentrates all of the bird's transponder transmitter power into a single, tightly formed coverage area. A hemispheric beam limits the signal to one hemisphere or another; everything north (or south) of the equator, for example, or, everything east (or west) of the bird's longitude location. A global beam spreads the signal out over all of the visible earth below; roughly 40% of earth from any single (22,300 mile high) Clarke orbit location.

Domestic satellites (Domsat birds) are, by definition, spotbeam birds. And, a spotbeam bird is the MOST LIKELY bird to have a 'puddle secondary pattern.' In the process of making a tightly confined (spot) beam, there are unwanted 'sidelobes' that pop up. A sidelobe on a transmit antenna creates one or more puddles; an unwanted

stone age



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15 16
17 18

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HBO IN TAHITI/ continued from page 31

sidelobe on a receive (TVRO) antenna causes the antenna to have pickup in some unwanted direction.

Now Galaxy; one, and, two. By definition, they are domestic spotbeam birds. However, if you look at where their patterns REAL-LY go (beyond the oft-published CONUS coverage), you will see that both birds are essentially hemispheric coverage birds; with usable signal levels virtually to each of their visibility horizons

Let's draw some maps. Galaxy One first since it has the most television on board. First let's define our limits and then we'll talk about service contours. The Galaxy One and Galaxy Two footprints are, for all practical purposes identical; if you overlook (briefly) that Galaxy One sits west of CONUS and looks back across the continent from west to east, while Galaxy Two sits east of the continent and looks back across the continent from east to west. In theory, this says that you have a segment of the antenna system on 'One' which is cocked away from the earth below to the west/northwest (i.e. back under the wing of the bird), while on Galaxy Two you have the same potential 'shadowing effect' tucked back to the east/northeast.

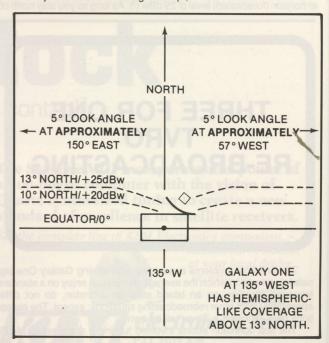
If you go beyond the FCC filed contour maps, you see that Galaxy will place a 25 dBw signal all the way to the horizon, to the west and east, along a line that is roughly 12/13 degrees above (north of) the equator. This suggests that if you are located at ANY location that is 13 degrees north, and you have line-of-sight visibility (i.e. the bird is above your horizon) to the bird, you should find no less than a 25 dBw signal to work with. From our first table (here), we can translate that into 'usable signals' with a high quality 16 foot dish or a 20 foot dish. To place some place-names on such locations let's assume we have an arbitrary 'cut-off' at the 5 degree look-angle point; the bird must appear 5 degrees or more above our horizon or we won't see it properly.

1) To the west, this places useful G1 signals into locations such as:

- A) Kwajalein Island (Marshalls) / 20.4 degrees 'up';
- B) Ponape (Carolines) / 13.9 degrees 'up';
- C) Midway Island / 32 degrees 'up';D) Wake Island / 23 degrees 'up.'

The useful locations for Galaxy One, going west, extend to at least 150 degrees east longitude at 10 degrees north (Guam is far enough **North** — 13 degrees — but Galaxy 1 rests just **below** its horizon).

- 2) To the east the locations are far more familiar to most readers and an extensive list is not required:
 - A) Barbados / 6.9 degrees 'up':



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B) Georgetown, Guyana / 4.2 degrees 'up.'

Georgetown is, however, just under 7 degrees north of the equator, which places it inside of our arbitrary 12/13 degree latitude cut-off point. However, remember that Galaxy One is 'cocked' or 'twisted' as it looks back to the CONUS area in a north/northeasterly direction. This **should swing** the eastern horizon footprint around slightly to the south, and while verification is suggested, the evidence does suggest usable (at low look angle) signals nonetheless. And those that are located closer to the bird (between 150 east/10 north on the west, and, 57 west/6.5 north on the east) should find plenty of G1 signal to work with.

The case for Galaxy Two is considerably more exciting, even if the ONLY present video on G2 is in the form of AFRTS on transponder 20. Looking west, G2 runs out of horizon between the west coast of North America and Hawaii. That particular 'fringe/horizon' region does not offer much in the way of terminal sale possibilities. The eastern direction, however, is more 'saleable.'

- To the east, Galaxy Two is approximately visible at locations as follows:
 - A) Godthab, Greenland / 16.55 degrees 'up';
 - B) Azores (islands) / 23.6 degrees 'up';
 - C) Reykjavik, Iceland / 22 degrees 'up';
 - D) Dakar, Senegal / 23.3 degrees 'up';
 - E) Casablanca, Morocco / 11.4 degrees 'up';
 - F) Lisbon, Portugal / 10 degrees 'up';G) Dublin, Ireland / 5.5 degrees 'up';
 - H) Timbuktu, Mali / 10.2 degrees 'up';
 - I) Channel Islands (British) / 3.8 degrees 'up';
 - J) Niamey, Niger / 4.9 degrees 'up.

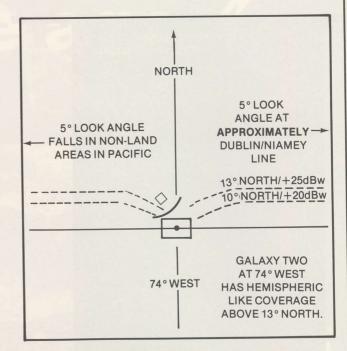
Again, keep in mind that the bird's 'horizon to horizon' coverage is somewhat modified by the 'twisted/cant angle' of the bird as it points the antenna array back towards the center of CONUS. The area most likely to be adversely affected by this is that portion back 'under the wing' to the east on G2 and to the west on G1.

HOW Rapidly It Falls

In the case of G1 and G2, we have a very abrupt 'fall-off' in on ground dBw levels as we scoot closer and closer to the equator, and move further and further to the east or western visibility horizon of the bird. For example, on G1:

- 1) 180 degrees (east or west), the signal contour at 13 degrees north is 25 dBw;
- 2) At 10 degrees north, it has dropped to 20 dBw;

On the other hand, at 16 degrees north it has risen to virtually the at-horizon (forecasted) level of 29 dBw (!). As long as you stay north of



the 'ridge lines' you will find essentially 'flat contouring' all of the way to the horizon.

DO G1 / G2 Puddle?

The Galaxy birds differ from the RCA birds in several essential ways. Hughes accepts that a tightly coupled feed, designed for a 'tight spotbeam' is likely to puddle. They work around this 'problem' by designing what is essentially a 'hemi-beam.' (Hughes might deny that is their design motivation, but both their antenna patterns plus the measured field results suggests that this is the end result, nonetheless.)

Whether Galaxy birds puddle, or not, is not clear from the antenna range tests although the data does suggest they will be remarkably clear of this affliction. Older Hughes built birds, such as those for Western Union, do have 'puddles' as we shall see in August when this series continues with a look at some truly 'exotic' puddles, **including RCA's F3R into Tahiti** on a pair of transponders only!

THREE FOR ONE TVRO RE-BROADCASTING

The practical problems associated with turning Galaxy One signals into television which the average person can enjoy on a standard television receiver, on an island such as Johnston, do not differ appreciably from other rebroadcasting situations; except. The exceptions give Johnston a 'flavor' all its own.

The first Johnston efforts involved turning a stock set of MATV

equipment into a rebroadcasting system. This can be done with marginal success if your coverage demands are small; **see illustration here.** The concept is so deceptively simple that virtually nobody can get into (technical) problems following the (outline) show here.

The 'through-the-air-game' follows these concepts:

- A) All it takes to get a signal to go through the air is to make the 'modulator signal' strong enough that if you connect its output to an antenna, the signal will travel some distance through the air.
- B) Having 'launched' the signal, you have to accept that transmitting a very weak signal over a short distance is the same as transmitting a very powerful signal over a long distance.

This simply means that the 'radiated field/signal strength' is not going to be very strong, and at each receiving site, you will have to compensate or make-up for that shortage with a more powerful receiving (antenna) installation. In a word, a 'fringe area' can begin virtually at the transmitting antenna itself.

Most people accept that a 'transmitter' is a fairly complex piece of equipment requiring special engineering talents to install and operate. If you stay in the **flea-power class**, this is NOT the case and if you are comfortable with cable distribution techniques, you can get by quite nicely.

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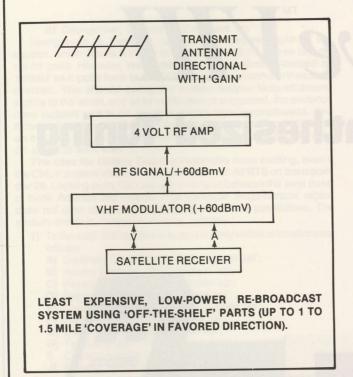
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satellite earth station at your local dealer or write to:







this month) are aware that we have at least three distinctive 'classes' of modulators available;

- Low (low) power, typically found in TVRO receivers, adapted from VCR modulators, capable of feeding one to four television sets with a maximum output 'power' of between 6 and 15 dBmV:
- Medium power modulators, designed for non-adjacent channel (non-critical) use in MATV and SMATV systems, typically offering an output 'power' between +35 and +50 dBmV;
- 3) High(er) power modulators designed for cable television system use, with built-in (lower) adjacent channel vestigal sideband filtering (to allow use in systems with immediately adjacent channels), offering power outputs up to +60 dBmV.

Transmitting through the air, using this type of equipment, is 'power level' conscious. The signal, on a standard VHF channel (i.e. 2-13) will attenuate (weaken) approximately 70 dB in the first 1/4th mile or so. If we require a signal that is say 0 dBmV (1,000 microvolts) for a high quality picture, and we are within the first 1/4th mile (roughly 1,300 feet) of the transmitting antenna, we will need +70 dBmV of output power to cover that 1/4th mile. Why? The first quarter mile is a killer; if we have 70 dB of path loss, we need 70 dB MORE signal at the transmitter device than we require (i.e. want) at the receiving site.

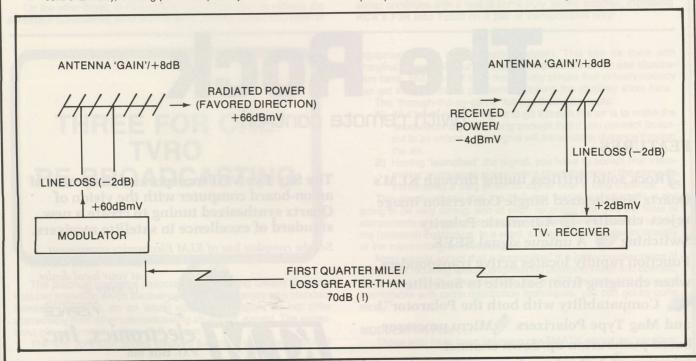
The system's total 'radiated power' is the SUM of the transmitter output power PLUS the gain of the transmitting AND receiving antennas. An example:

- 1) Transmitter (modulator) output = +60 dBmV.
- Using a five element yagi antenna, cut to the transmission channel, we have 8 dB of gain.
- 3) Between the transmitter (modulator) output connector and the input to the transmitting (yagi) antenna, we have 2 dB of cable loss. Now our 'radiated power' is 60 dBmV + 8 dB (+68 dBmV) the 2 dB of line loss; or, +66 dBmV.
- At the receiving site we have another five element (yagi) antenna with 8 dB of gain.
- Between the receiving yagi antenna terminals and the TV receiver, we have 2 dB of cable loss, again.

The radiated signal is +66 dBmV; the receive antenna **system** (net) gain is 6 dB (8 dB antenna gain -2 dB line/cable loss). The total signal 'budget' is 66+6 or 72 dB. The (example) path loss is 70 dB. The net signal delivered to the antenna-input terminals on the rear of the TV receiver is therefore 72-70 or +2 dBmV (approximately 1,300 microvolts).

Now let's suppose we want to serve an area that is further from the transmitter than 1/4th mile (70 dB of loss). And we still wish to maintain the 0 dBmV (1,000 microvolts) to the TV receiver. If we double the distance using our previous example numbers, we will sustain an additional 6 dB of path loss. And we are at one-half mile. If we need to cover 1 mile, we double the distance again, and pick up an additional 6 dB of 'path' loss.

Let's shift gears now and talk about practical equipment, available through virtually any MATV equipment supplier. While the \pm 60 dBmV output level modulators are quite commonly available (in the \$700 up price class with some notable exceptions) not all MATV systems are designed to function with this 'low' an output level. Some systems require higher output powers to service the full 'cabled system.' This prompted firms such as Jerrold, Blonder Tongue, Benco and others to



offer '4 volt output' (high power) amplifiers. A 4 volt amplifier is in the +72 dBmV region and that is a 12 dB power increase over the more commonly found 60 dBmV output modulators.

These amplifiers are NOT considered transmitters, however; they are still a basic ingredient of the cable distribution system, and are priced at about half of the +60 dBmV output modulators. The net result is that you can 'serve' an area perhaps one mile across with around \$1,000 in equipment; or less.

This is all diagrammed here.

On Johnston Atoll, the original installation (see pages 4, 5; 74-87 here) was made operational on April 02, 1983. The system employed a 30 foot dish (gain in the 48 dB region) of uncertain design and heritage, a 120 degree Dexcel LNA, an AVCOM 66T BDC type receiver, a Jerrold MATV grade modulator and a 'high power' Jerrold HPM (4 volt) type amplifier.

Operating on VHF channel 4, the original intent was to transmit a signal over a distance of well under 1,000 feet, to a 'club' facility where personnel gathered. Consideration for simply running a chunk of coaxial cable between the two locations was quickly discarded since the cable would require burial of the line, and offered no possibility to expand the service to other locations, without running additional cable.

As often happens in such a situation, those living outside of the original 'service area' soon were trying to pick it up as well, and pressures quickly developed to increase the coverage to an 'island wide' system.

Because the original intent was to broadcast the satellite signal only to a single location, the initial choice for a 'transmitting antenna' was a five element, single channel (4), home type 'yagi' antenna. This sent a directional transmission beam towards the targeted-club, but left other potential receiving sites located off to the 'side' of the transmitting antenna, or behind it, in a weak-signal region; even if they were quite close to the transmit antenna.

This problem was temporarily solved by removing all of the elements, except the driven/radiator element, from the five element yagi. This left a 'dipole' as a transmitting antenna and it provided equal transmission power in two directions; at right angles to the dipole itself. Then to get more signal into more locations, the height of the transmitting dipole antenna was raised. Now the service extended to perhaps 1/2 mile in two directions, but required outdoor receiving antennas at all locations; even those close to the transmitter.

Buoyed by the success of the initial system, plans were drawn to expand it to first two and ultimately three island-wide channels. They took their system problems to United Satellite Systems (*) and USS in

turn put together a package of equipment and technology which would customize a system for Johnston.

MORE Power Than . . .

The TVRO receive site/transmission site is located essentially in the middle of the Pacific atoll. This (fortunate) fact made system design somewhat less complex. The majority of the housing was in three directions; N.E. and S.W., and S.E. This required a special approach to the transmitting antenna system, as we shall see.

The design goal was to have a system which would 'penetrate' all of the island buldings allowing quality reception with set-top (i.e. rabbit ear) antennas. At the present time most of the in-use residence areas have a rooftop master antenna. The master antenna then drives multiple set 'couplers' (signal splitters) which in turn carry the antenna received signal to wall outlets within individual living units. However, a substantial increase is expected in the local base population over the next few years and the majority of these people will live in transient quarters (i.e. barracks) with no TV distribution systems. Thus the TV service needs to 'penetrate' the buildings' exterior walls at suitable signal level that inside reception is possible.

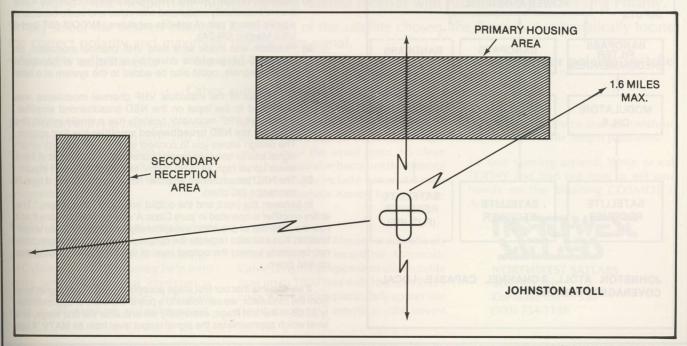
The maximum distance to be covered, on the other hand, was in the neighborhood of 1.6 miles. The island is flat so the height necessary to achieve line-of-sight transmission coverage to the edges is well under the 30 foot height selected.

The only unknown was 'how much power' would be required to achieve the design goals. Simulating the system in the Turks and Caicos Islands, we found that we could anticipate a 12 to 15 dB reduction in signal strength, at an 'indoor' location within 1.5 miles of a low power transmitter on VHF channel 4, when you switched from a suburban-rated roofop antenna to an inside set of rabbit ear antennas. Some of this loss is attributed to the actual 'gain' of the outdoor antenna (approximately 4 dB) and the balance was simply the result of getting the antenna clear of the blockage from the building walls (when VHF or UHF signals pass through structures there is signal loss caused by the attenuation from the structure).

We came to the measured and reasoned conclusion that if we had a transmitter capable of producing 6 watts of power output, connected to a transmit antenna with 0 dB gain (i.e. no directional gain), we would be capable of producing noise free pictures at a distance of 2 miles with typical indoor rabbit ear or 'rod' antennas.

TWO Channels?

The Johnston requirements, however, called for not one but twoinitial channels with the ability to expand to a third channel with a



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minimum of fuss. Previously such installations have been designed by taking two or more stand-alone VHF transmitters and connecting each to its own cut-to-channel VHF transmitting antenna. Was there not some method of eliminating both single-channel electronics AND single channel transmission antennas while still retaining multiple-channel service?

There were two obstacles:

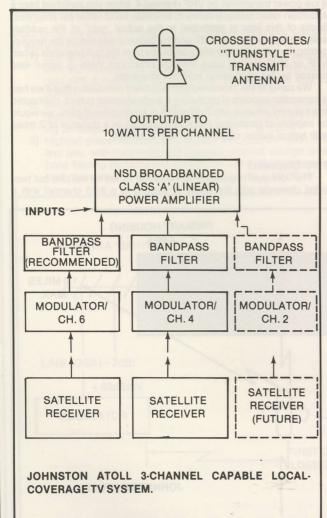
 Creating a broad-banded power amplifier capable of being 'driven' by two or more non-synchronous video carriers, and,

Creating an omni-directional (i.e. 360 degree coverage) transmitting antenna which would perform properly (good impedance match) over at least a three-TV-channel frequency range.

The broad-banded (i.e. wide frequency range) solid state power amplifier seemed like technology that should already exist. We were puzzled why in searching the world for literature on such a unit that we continually came up empty handed. "Had nobody ever wanted to transmit two or more TV channels through a common broadbanded transmitter amplifier previously"?

So we took our problem to **Tom Litty** of **NSD**, **Inc.** (**), a firm that builds relatively custom medium and high power amplifiers for both military and civilian applications. NSD routinely turns out mobile and fixed amplifiers that operate on frequencies up to 900 MHz with output powers of 250 watts and more. Those are good numbers for solid-state designs.

Litty immediately saw that because this would be a continuous duty application, normal 'two-way-radio' design criteria would not be sufficient. When you design a power amplifier for two-way radio



///// -> ONLY

DIRECTIONAL/YAGI ANTENNA PROVIDES TRANSMIT SIGNAL 'GAIN,' BUT AT LOSS IN COVERAGE REGION (ONLY COVERS SETS IN-FRONT-OF THE ANTENNA).

HERE AND, HERE

DIPOLE (TOP-DOWN VIEW) TRANSMITS IN TWO DIRECTIONS, BUT AT LOSS IN SIGNAL STRENGTH (NO GAIN)

applications, you acknowledge that people using two-way radios don't 'talk' 100% of the time; they listen some portion as well. A normal procedure is to accept that the power amplifier will 'amplify' no more than 50% of the time. If you are amplifying half the time, your entire system is 'resting' the other half. That means that it is only generating heat (and making electronic parts super hot) half the time. **The cooling-off-period is important**.

A television service power amplifier does not rest; it will turn on, and typically stay on until something breaks. It will reach a certain internal heat level and then retain that temperature for the balance of its operating life. Calculation of heat, since too much heat destroys solid state transistors and other parts, is a key design task.

This discussion of heat and heated parts is relevant because in the Johnston installation, somebody neglected to make a 'worst-case-assumption' when calculating heat. Before we would finish with the project, we would regret this 'oversight.'

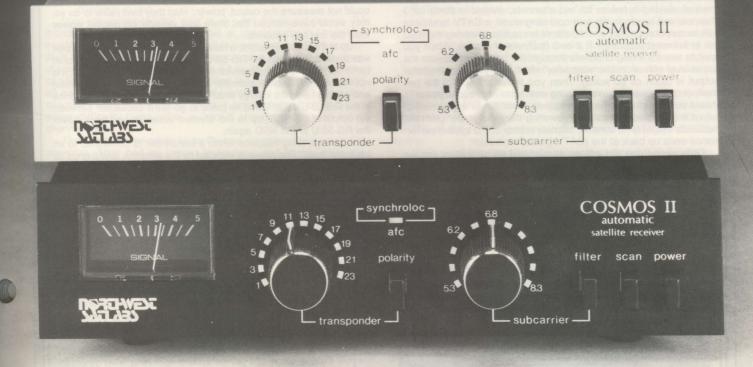
The system went together as shown here in illustration form:

- Separate (Triple Crown) VHF modulators for channels 4 and 6 were individually modulated with video and audio baseband signals from a pair of satellite receivers (AVCOM 66T and a USS/Maspro SR-2A).
- B) Provision was made so a third VHF channel modulator, on channel 2 for example, driven by a third set of baseband satellite signals, could also be added to the system at a later date.
- C) The output of the individual VHF channel modulators was connected to the input on the NSD broadbanded amplifier. While each VHF modulator typically has a single output, the input for the NSD broadbanded amplifier has four spigots. The design allows you to connect up any television (or other) signal source between approximately 50 and 100 MHz at input levels up as high as +60 dBmV at any of the (four) inputs.
- The NSD broadbanded amplifier has a single output; a type N connector (50 ohm).

In between the input and the output are three 'gain stages.' The entire amplifier is operated in 'pure Class A' design which means that it has the potential of providing exceptionally high quality video amplification. You can also regulate the output power, on any single channel, by simply turning the **output** level of the TV channel **modulator** up and down.

If we assume that our first stage accepts a ± 50 dBmV signal level from the modulator, we can relate to a power increase of approximately 20 dB in the first stage; essentially we are, after the first stage, at a level which approximates the signal output level from an MATV '4 volt

SKEW NO MORE



Introducing the Cosmos II Automatic.

The world's first inexpensive, fully integrated satellite receiver with Automatic Signal Seeking Polarity.

Simply select the desired channel. Regardless of the satellite chosen, the Cosmos II automatically locates the correct polarity and maximum transponder signal.

- No skew adjustments
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DOWNCONVERTER: Dual Conversion. Extremely low noise figure and no images or ground loop "hum bar" problems. Automatic temperature compensation to minimize drift in extreme environments.

VIDEO: Maybe the cleanest you've ever seen. Automatic fine tuning eliminates the need for "best picture tweaking." AFC defeat and SAW filtering help minimize potential terrestrial interference. Crystal modulator (channel 3-4) standard, as are scan tune and video invert.

AUDIO: Get set for a real treat. Listen to virtually all the narrow band audio channels *without* the usual static. So clean that the TV speaker becomes the limiting factor. Features include automatic muting and automatic narrow band volume compensation.

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So quit skewing around. Write or call TODAY and find out how to get your hands on the amazing COSMOS II Automatic.



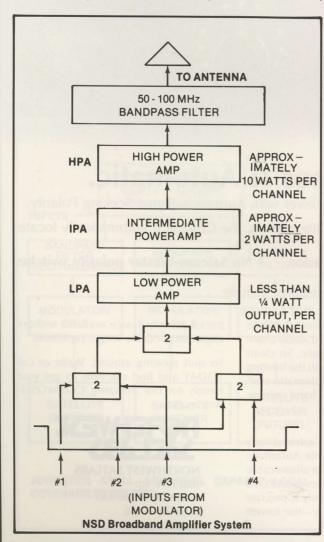
NORTHWEST SATLABS 806 NW 4th Corvallis, OR 97330 (503) 754-1136 amplifier.' **The next stage** provides us with sufficient gain that we can cease measuring it in 'volts' and start measuring it in watts; as much as 6 watts for the **total output** of three channels or 3 watts per channel with just a pair of channels through.

The last or final amplifier stage is identified, appropriately, as the 'HPA' or high power amplifier. 'High power' is relative, of course, and in this case it will amount to approximately 10-12 watts per channel with three operating channels through the amplifier. Now one of the 'pluses' associated with a 'Class A' linear amplifier of this sort is that it has a total output capability and you can use that capability for a single channel, divided in halves for two channels, divided in thirds for 3 channels and so on. In the real operating world, a CATV modulator with an output capability of +60 dBmV is capable of driving the NSD unit to full-rated output for 1, 2 or 3 channels of service. When you operate two (or three) channels through the unit, you measure the output level with an in-line 'wattmeter' which tells you what the total output is (such as 20 watts). Then you switch off one of the two channels and observe the remaining wattmeter-read output power. It should be 50% of what the two channels were. Since adjustment of output is controlled by raising or lowering the input power (with the modulator output level control), ultimate control of the system performance ends up back at the (CATV grade) modulator.

Only everything did not go as planned on Johnston and we found ourselves battling to leave the island with an operating two-channel system.

ANXIOUS To Try It

The NSD amplifier arrived on Johnston prior to the installation trip.



Sitting there in the box it was very tempting to 'at least' stick it into the equipment rack. And, once into the rack, it was a further temptation to plug it in; to AC and to the single (channel 4) modulator then in operation.

Carefully written instructions warned that the amplifier was NEVER to be operated without 'load.' In transmitter talk, that means 'do-not-turn-on' the NSD UNLESS a proper antenna is connected to the output. The folks on Johnston saw nothing 'wrong' with the dipole antenna they had been using so it was connected to the NSD output and the modulator ('drive') turned on. With no wattmeter handy, they could not measure the output 'power.' Had they been able to do so, they would have noticed that there was virtually no output power after the first few seconds.

Up at the dipole antenna, a receiving-grade matching transformer was installed between the RG-59/U feedline and the dipole 300 ohm terminals. This matching transformer has no 'transmission rating'; it is not intended to handle transmitter 'power.' It failed (saturated ferrite) and when it failed the energy which was coming towards the antenna in the RG-59/U cable found no place to go. So it 'circulated' between the output of the NSD, **up** to the 'shorted' antenna, and **back down** the RG-59/U to the NSD again.

A strange thing happens when a transmitter is connected to an improper 'load.' The power is rejected by the antenna, and it ends up back **inside of** the power amplifier. This is power looking for some place to go. It causes heat to build up inside of the power amplifier. **And heat is a no-no.**

The uncontrolled heating of the power amplifier was more than the cooling system built-into the NSD could handle. In just minutes the internal circuitry overheated and reached a dangerous operating condition. In a very short time the amplifier final power stage quit totally, along with a section of the power supply.

As all of this was happening, the folks on Johnston were unaware of the sequence of events. Without prior experience, and without proper metering equipment, they ONLY knew that the amplifier did not seem to provide increased signal strength at receiving sites. After waiting for it to work for a few minutes, they turned it off and awaited the arrival of the state-side installation 'crew.'

As is detailed in Coop's Comments this month, we did the only possible thing which would get the system operating; after determining that the NSD final amplifier stage was 'broken,' we removed it from the circuit and connected the intermediate power amplifier stage directly to the transmission antenna (the CORRECT transmission antenna!). This happened to be something which could be done with the NSD unit; not all would be designed so that this could be done and readers are warned to move with caution in attempting this sort of emergency field fix.



HBO (TR23) IS A COUPLE OF dB over threshold on USS/Maspro 70 degree LNC package (30 MHz IF bandwidth). Odd-numbered horizontal transponders were up between 2.0 and 3.0 dB from evennumbered verticals (Johnston reception, G1).

TRANSMISSION Antenna

When you are attempting to transmit three separate channels of television over TV channels 2, 4 and 6, you are asking a great deal of the antenna designer.

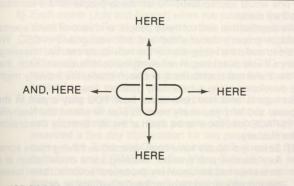
1) You wish an omni-directional pattern (i.e. equal signals in all directions, around a 360 degree circle);

You wish each of the three channels to be of approximately equal signal strength at all receiving locations;

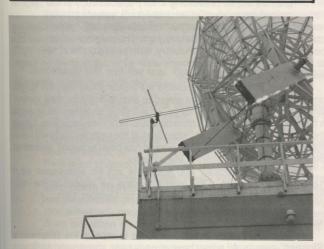
3) You want the transmitter power amplifier to 'look at' the transmission antenna and 'see' a suitable 'load' on each of the TV channels in use.

Very few antennas offer 'gain' in an omni-directional pattern. TV broadcast antennas accomplish this at considerable (i.e. big-big) expense by carefully building 'turnstyle/dipole' arrays. They accomplish this, however, on a single channel at a time, not over three channels that are spread out from 54 to 88 MHz. The wider the bandwidth or spectrum to be transmitted, the more difficult it is to build an antenna that will function properly. Antennas want to be 'narrowspectrum' devices, by nature. Even a single channel antenna has some difficulty being 'wide' or 'broad' enough to cover an entire

The problem was taken to an Oregon supplier of low power TV antennas. They had no 'magic technology' and frankly while the system they provided did function adequately on Johnston, there is room for improvement.



"CROSSED-DIPOLES" (TWO, PHASED OR STACKED TOGETHER) PROVIDES ESSENTIALLY 360° (OMNI-DIRECTIONAL) COVERAGE, BUT AT FURTHER LOSS IN SIGNAL STRENGTH.



RE-BROADCAST ANTENNA/ Turnstyle omni-directional array, phased and cut for channel 4 (center) covers entire island (and then some) from about 30 feet height above ground. Who says broadcasting TV is complicated!

1) The Johnston system is a compromise; a pair of phased dipole antennas placed at 90 degree (right) angles to one another. See photo here.

The dipole elements in the crossed fashion create what is basically a circular radiation pattern; each transmits from both sides (see drawing) of itself, and the 'sum' of the four radiation 'surfaces' or 'sides' represents a 'circle.'

3) The NSD transmitter has a 50 ohm output and the crossed dipole antenna is 50 ohms. A length of RG-8/U, RG-213 or better yet, RG-214 cable connects the two together.

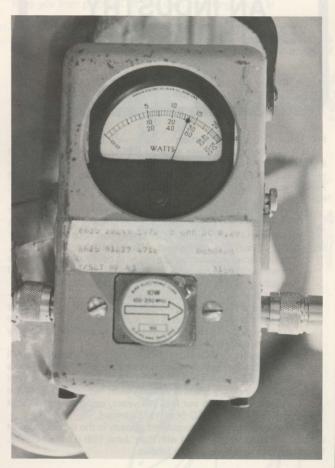
4) The dipoles were cut or tuned to VHF channel 4. Naturally that is not optimum for channel 2 nor 6. In the real world, when you have an antenna that is operating 'above' the signal frequency, you have 'mis-match.' That means that because the antenna is not a proper 'load' at the transmission frequency, some of the energy is 'bounced back' by the antenna and it ends up back in the transmitter again.

In practice, when you have an antenna cut to channel 4 (for transmission) and transmitter signals going to the antenna on channels 2, 4 and 6, you have varying amounts of 'mis-match'; a function of the operating channel. On Johnston, we found the following

1) Channel 2 (below the cut-antenna frequency)/ with 3 watts to the antenna, 1.5 watts reflected (0.3 watts would have been acceptable);

Channel 4 (at the cut-antenna frequency)/ with 3 watts to the antenna 0.1 watts reflected;

Channel 6 (above the cut-antenna frequency)/ with 3 watts to the antenna, 0.5 watts reflected (0.3 watts would have been



5.4 WATTS OUTPUT/ with two modulated channels through the drive-IPA stage. Plenty of 'goo' to cover the 1.5 mile extremes of Johnston.



OFF To The Receive Sites

Once the system was operational, a thorough check of the island coverage was conducted. In a brand new installation, you would net it to take a small outdoor receiving antenna, mount it on a short mast, connect some cable to the antenna and then drive around (the island) to make a suitable number of measurements. Since there were already TV antennas on virtually every building, we simply moved from building to building with a CATV-grade field strength meter and 'hooked up' to the TV antennas at each location.

We found that our channel 6 signal lagged behind our channel 4 signal, in signal level, by from 2 to 3 dB at all but two locations. Those two locations were close together. One could compute the signal loss resulting from the slightly mis-matched transmitting antennas (designed for channel 4) and accept the 2 to 3 dB difference in level quite readily. At a distance of over 1.5 miles, the most distant TV set on the island, we were still in the 800 microvolt region on channel 6 and the 1,000 microvolt region on channel 4. And this was operating at a level which was between 10 and 12 dB lower than the system would ultimately produce when the HPA (high power amplifier) stage was repaired and returned.

DUPLICATING The Johnston Tests

The concept of two, three or even four channels through a single power amplifier seems proven on Johnston. Fears of nasty problems with inter-modulation products and other degradation were unfounded. It surely would be possible to crank up some stages 'too hot' and have interference between separate stages, but at the recommended levels of NSD, these will not be a problem.

Locations requiring omni-directional coverage would probably do better with multiple dipoles, phased, with one dipole for **each** 180 degree circle-part **for each channel** in use. Locations with all of the coverage in one or two directions would be far better off to use wideband 'log' design antennas (they are easily broadbanded to cover several TV channels at once) directing signal into the appropriate regions.

*/ USS-United Satellite Systems, St. Hilaire, Mn. 56754; 218/328-7733

**/ NSD, Inc., (National Solidstate Devices), 10936 Portal Drive, Los Alamitos, Ca. 90720; 714/527-4896.

CSD IS THROWING AN INDUSTRY BIRTHDAY PARTY!

FIFTH BIRTHDAY Celebration

In and with the June 15th issue of CSD/2, readers received an 8-page pamphlet which described a very extensive 'all-industry-birthday celebration' planned by CSD and Coop to mark our first half-decade of 'survival.' For those who have not seen that material, here, basically, is what is planned:

1) At the forthcoming SPACE/STTI show in Nashville (September 3, 4 and 5), CSD along with a selected group of 'co-sponsors' is holding an industry birthday party (the noon-hour of September 4th). Everyone is invited, there will be no charge, and a special 'program' will be put on to celebrate the industry's growth and achievements. There will be a very special set of awards given, and we'll talk about those separately.

2) On the first of October, CSD will issue a special commemorative issue of CSD. This will be in celebration of our industry's fifth birthday, and the start of our sixth year as an industry. We expect it to be 200 to 250 pages 'big' and it will be unlike any previous issue of CSD in many, many ways.

3) On the evening of October 18th, on a 'popular satellite' you will find visible for North America and beyond, we'll be televising a 'two-hour-industry-special'; a birthday party to celebrate not only our industry starting its sixth year, but also to mark the important events in our first five years, using videotape shot and gathered by CSD from 1975 onward.

All of this has been well explained already in the 8 page booklet which CSD/2 readers received with their June 15th issue of CSD/2. What was **not revealed** is what follows.

PIONEER's Pioneers

In reviewing the events that led up to our industry's launch on October 18, 1979, and those that transpired during the first year or so

thereafter, it became clear that there had been a handful of 'watershed' events, or contributions, from various individuals which formed cornerstones for our industry's development. We made a list of those events, the people responsible for those events, and thought about how one would appropriately 'honor' these people for the contributions they made.

We decided that each of these people, and each of these events, should be properly documented and then recognized in CSD. We wanted to make the recognition of the individuals involved 'meaningful' since it was clear to us, in reviewing the contributions of each, that had the individual contributions not been made, the industry might have developed along substantially different 'lines.'

So here is what has been done, how YOU play a part in the process, and why you really need to plan to attend the Nashville STTI/SPACE 'joint show' to be a part of the fifth Birthday Celebration for the industry

 Seven individuals have been selected as having made some 'key' discovery, or process, or taking some crucial action at a time when had the discovery, process or action not been taken, the industry would have suffered a setback or defeat.

2) CSD has commissioned a talented artist to prepare a caricature of each of these individuals; an 'original' drawing which portrays the individual and his (sorry, they ARE all hims!) work and contributions

 During the special 'Fifth Birthday Party Celebration' in Nashville, we will be presenting a very special copy of the original caricatures to each of the individuals selected.

The Nashville Birthday party will include giant amounts of cake, ice cream, soft drinks and a special program. The program will consist of a portrayal of the history of the industry, from before October 18th, 1979 to the present time, using a combination of 'industry stars' on stage, and, some brief videotape clips.

All seven of the award recipients will be identified from the stage, one at a time, and they will be asked to step forward for their award. While they are coming to the stage, we will show on television screens a minute or two of their work from our CSD/WIV videotape files. Using this 'Oscar Awards Format,' attendees at the birthday party will have the opportunity to see why each person has been selected, and what their contribution has been to the industry.

The awards ceremony and the party will be videotaped as it happens and excerpts of the awards portion will appear on the two-hour television special to be first-shown on October 18th.

NOW/ How Do YOU Participate?

As noted, there are seven individuals to receive the "Pioneer's Pioneer" awards. All seven have already been chosen and each was selected because he was the cause of some very important watershed type of event that provided direction to our industry in its founding year or before.

CSD has arranged with Boman Industries to make available, free

simply for the asking, your very own 'limited edition lithoprint' for each of the seven caricature-pieces of art. Boman is graciously picking up the tab (and it is considerable) for publishing and distributing these

The prints have been designed so they are sufficiently large (11 by 14 inches, approximately) to be excellent 'in-store' wall decoration pieces; the first 'universal art' for our industry! We believe every dealership will want to collect the full set of eight (we said eight) to decorate your showroom or office. We also believe that years from now the 'limited edition prints' may have more than intrinsic value since they will mark the birth of an industry, and the key people who participated in that birth.

Here's how you will collect all eight prints.

1) You will have to complete a 'print request form' each month for the next seven months, as published here in CSD. Our first form appears here.

2) The form asks you a few marketing type questions; Boman is spending big bucks on printing and handling the requests for free prints and we think they are entitled to ask a few questions about marketing of TVRO equipment to qualify you for a 'free

Between this month and September, there will be a 'Mini-Contest.' The first month, this month, we are announcing the first of the seven (we said seven) selected individuals. We are not telling you who the other six are. Next month (August) we will display the print of the second announced awardee but that will still leave five names unknown.

Each month (July and August) when you complete the Boman 'Print Request Form' and answer a few marketing questons, you will also have the opportunity to make your own guesses for all seven of the individuals who have been selected. Obviously after you receive the August issue of CSD, you will have 2/7ths 'known' and that will only leave five to actually

quess.

We will take all of these entries and check them for 'guesses.' If we find one with a 100% accurate list, and nobody else guesses all seven properly, that person will automatically be awarded a five day trip/vacation for two people to Providenciales in the Turks and Caicos Islands, as a guest of Boman Industries and CSD/West Indies Video Television. A rather neat 'winter-time' vacation! Now, if we have two or more who guess correctly, then we will have a 'public drawing' for a winner during the Nashville Birthday Party. And, if nobody guesses all seven but we have one or more guessing six (or five, etc.) correctly, we'll award the Providenciales trip to either the one closest winner, or to the person whose name gets drawn out of the hopper during the birthday party.

6) You will have at least two chances to win, by requesting the free industry Pioneer Print during both the July and August 'contest periods.' You will also have another opportunity to increase your chances of winning if you attend the Nasville convention; we'll tell you about that in the August issue of CSD

Somebody will win the trip. The winner will be announced at Nashville during the birthday party. It could be you!

Now, here are some general guidelines as to what we were mindful of as we selected the seven (we said seven) "Pioneer's Pioneer" people:

- 1) There have been many crossroads for the industry. Some have been technical, some have been regulatory/legal, and some have been philosophical. We looked for people who made a single type of technical breakthrough that changed for all time the direction the industry was headed, people who consistently and persuasively pushed for a certain direction for the industry (and prevailed), people who were 'there' when the chips were down and when we needed a certain type of action and sup-
- In other words, the seven chosen for the "Pioneer's Pioneer" award are people who have been crucial, critical or 'pivotal' in the development of the home TVRO industry.

That's the end of the advanced guidance. Now you are on your own.

EIGHT Prints?

Arthur C. Clarke is NOT one of the 7 to receive awards. He is, however, the eighth person who will be honored by the series of prints. Clarke's contribution transcends all others and that should be obvious to all but the most novice of industry participants.

A very special Arthur C. Clarke 'commemorative print' will be the 8th in our series and when the first seven have run their course (the months of July 1984 through January of 1985), then the Clarke print will be available. Initially, it will ONLY be available to those individuals who have, faithfully, written off to Boman in each of the seven preceding months for their routine monthly 'new print.' Those who have collected, month by month, all seven that preceded, will automatically, without writing off again, receive the Clarke print as the eighth in the special birthday set.

LIMITED Edition

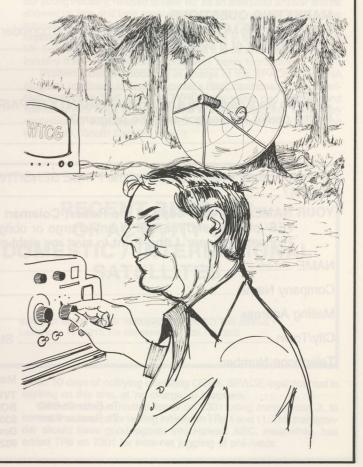
We said there would be a limited edition of prints. That means that some finite quantity is being printed of each of the 8 and when they are gone, no more will be pubished. We are doing this to create a 'real value' for the eight prints, and the original litho plates are being destroyed after each press run. No big deal; we just feel this is an important part of our industry's heritage and we want to 'do it right.' Naturally that suggests that you should not let a month slip by without sending off for your own print.

DO IT Now

A full page form appears here. It extracts a painless amount of information from you in exchange for prompt shipment of the first print in the 'collection.' There is a deadline; you must request the print with a postmark prior to August 1st to qualify for this month's print. That's to keep you from putting it off and then forgetting about it!

PIONEER'S Pioneer Number One

His name is Robert Coleman. He was born nearly fifty years ago in South Carolina, and he still makes his home there in the town of



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WHO ARE THE INDUSTRY'S SEVEN "PIONEER'S PIONEERS"?

A CONTEST:

To mark the 'Fifth Birthday' of the home TVRO industry, **CSD** and many of the manufacturers and distributors to the TVRO industry are sponsoring a series of 'Fifth Birthday Events' designed to focus national attention on the home TVRO industry, its equipment, **and dealers**. We invite you to participate. In this portion of the 'Fifth Birthday Celebration,' you are asked to select those seven individuals whom you feel made significant contributions to the industry during the time-frame 1978-1981. Simply fill in the six blanks below, selecting the six individuals you believe would complete this 'Silent-Seven' list. Then be prepared to enter again in August, **and**, attend the SPACE/STTI joint-show in Nashville and the 'Fifth Birthday Party Celebration' at noon on September 4th!

My Guesses For July Are: 1) Robert Coleman 2)	ontest entry form; an office and fill in your name, firm d announced during the N	e-machine copy is a valid entry. name and address to complete lashville Birthday Party and the
winner plus a guest will be flown to the Turks and Caic CSD and Boman Industries. On 'Provo' you will be atmosphere of a peaceful Caribbean hide-away, plus be television and FM radio facilities on Provo. A rather	os Islands for a five day va the guests of WIV-TV/ nave the opportunity to tou	acation, this winter, courtesy of CSD and enjoy the 'laid-back' r the CSD test facilities and WIV
MARKETING QUESTIONS: 1) What are the MOST IMPORTANT factors you constre-sale as part of a system package?		RO receiver model and brand for
2) If you were designing a national WARRANTY/REF for the dealer to interface with the program?	PAIR service for TVRO re	ceivers, how would you set it up
3) In your area, where do you feel the PRICE SENS dollars)?	SITIVE point is in fully inst	called, home TVRO systems (in
YOUR NAME/ and your copy of the Robert Coler YES/ please send me free of any charge or 'Pioneer's Pioneer' Litho-Print to start my eig	obligation my copy of the	e brand new Robert Coleman
NAME	5 1937 OF TOURS DES	Swit makes and peoples aw to 10 Mgr
Company Name	SUB-PANIES ANGUER FOR	Total construction with many construction (in
Mailing Address	a shem only sloped to	have been philosophical Wallocken
City/Town	State	Zip
Telephone Number		(and prevailed), people who were the
To Enter Contest/ To Receive Print/	Mail before August 1, 1984 t TVRO Birthday Party BOMAN INDUSTRIES 9300 Hall Road Downey, California 90241	

Traveler's Rest. Robert Coleman taught us that TVRO systems do not have to be expensive, or fancy. He proved many existing theories about microwave technology either 'wrong' or 'incomplete.' His first TVRO terminal cost him just over \$150 and had pictures on it that rival many of today's 10 foot systems.

Robert Coleman has been a licensed 'ham radio operator' since his teens. His natural curiosity about things electronic led him to those areas of electronics which his youthful 'budget' could afford. He guickly found that his ambitions were greater than his pocketbook and he also discovered a facet of electronics which many other 'hams' had also discovered; 'surplus equipment.'

Starting with the end of world-war two, up to the prsent time, it has been the tradition of the military to replace various electronic and communication systems and sub-systems every five to ten years. That's the military way of 'keeping up' with technology. Coleman discovered that when the military upgraded their systems, they almost 'threw-away' their older systems. Sometimes they literally gave the pieces and parts away; other times they sold them to 'surplus vendor agents' by weight or volume rather than by 'value.' Coleman made it important to learn when and where the military would 'dump' older electronics and he got himself into the 'stream' of discards

He also discovered that some of the larger electronic/communication firms in the United States did the same thing; Bell Telephone in particular. By 'hanging around' people who worked inside of the telephone company, Robert learned when and where they would be discarding telephone microwave equipment. After a few years of collecting, he had a warehouse filled with surplus equipment and contacts all over the United States who did the same thing.

When he read an article about the early home TVRO experiments (in 1977 and 1978) he remembered that some of the electronic equipment he had assembled into his warehouse had been microwave video equipment. Some of it had been military, some had been Bell. He started looking for the sub-system pieces necessary to patch together a home TVRO built totally around surplus electronic equip-

A patient man, he would be until the winter of 1978-9 accomplishing his task. The first pictures he saw, using an 8 foot 'surplus,' spun dish propped up against a tall South Carolina pine as a very elementary Az-El mount and a slightly 'converted' Bell 'TD-2' microwave receiver, came from CBN and WTCG (now WTBS). With great excitement he called Coop on the telephone to report his success.

But the Coleman contribution was far greater than simply turning some surplus electronics into a system that produced 'pictures from space.' Through his several decades of 'ham radio' he had learned the fine art of building exotic equipment on a workbench or kitchen table. When his first system produced pictures, he immediately went to work on a 'second system.' Recognizing that he needed more LNA stage gain, he decided to build an LNA. If that sounds 'far out' in 1984,

you should have been around in early 1979! Many people would tell Robert 'You can't do that . . . it takes tens of thousands of dollars in test equipment.' Robert would just smile, and move ahead.

When the industry first met as an industry, in Oklahoma City in August of 1979 for the first industry trade show (SPTS '79), Robert Coleman was on hand to share his experience and knowledge with the 500 plus people who traveled from throughout the world to be a part of the birth of an industry. In Oklahoma City, Robert introduced two 'new concepts'; LNCs, and, single conversion receivers. Neither was perfected but he had working examples of both on hand. He also had a sackful of LNA circuit boards which he had built, and parts sources for people who wanted to build their own LNAs. He gladly, openly, shared all he knew about all of these arts and encouraged others to 'try it . . . the worst that can happen is that you fail!'.

In the months that followed the first SPTS, he continued to share his hands-on technology experience with dozens of those whom he first met in Oklahoma City. He was instrumental in getting early antenna producer Starview out of some tight technical spots and into production. He joined forces with Taylor Howard and they made available circuit boards and parts for the fabled 'Howard-Coleman' receiver; getting literally hundreds of people their first TVRO pictures. In fact, if somebody had taken a 'survey' six months after SPTS '79 in Oklahoma, of all of the **operating** TVROs in private hands in the United States (and Canada), surely 75% or more would have been using 'Howard-Coleman' receivers!

Robert Coleman. He never learned the meaning of "It cannot be done . . . ", or the meaning of "That will cost a great deal of money to do . . .", nor the meaning of "What I know is a secret from you . .". He openly and willingly shared all of his experience and kitchentable learned expertise with dozens, indeed hundreds of others who had the interest, enthusiasm, and drive to 'want to break into TVRO'

but who were confused and muddled by it all.

Out of the Piney Woods of South Carolina, he maintained a 'beacon of light' and 'common sense' which the industry sorely needed in 1979 and 1980. Robert Coleman, more than anyone else in our young industry, refused to take 'no' as an adequate answer and he showed us time and time again that if you will try, you can often do the impossible. As Robert is still fond of saying, "Without money, the impossible just takes a little longer." But in the talented hands of Mr. Coleman, it will be done. He proved it to us and now we have an industry that has been built on that very same foundation.

(Robert Coleman today is in charge of the SPACEvision LNA program, continues to live in Traveler's Rest, operates a cable television system he built after the TVRO early-years had passed, and spends a very large amount of time in Japan 'teaching' some very sophisticated Japanese GaAs-FET LNA engineers how to do the

impossible, 'South Carolina style'!)

TRANSPONDER WATCH

RECENT REPORTS OF ACTIVITY ON **DOMESTIC / INTERNATIONAL** SATELLITES

Send your reports to CSD Transponder Watch, P.O. Box 100858, Ft. Lauderdale, FL 33310. For late news, call (305) 771-0505.

FCC labs has begun crack-down on TVRO receiver manufacturers, notifying both OEMs and distributors that certain receiver/modulator configurations are 'not legal'. Any receiver with a built-in modulator MUST HAVE type certification; many being sold do not. FCC apparently is NOT interested in stopping shipments of receivers now being built, but does want compliance and 'plan' to correct 'oversight'

within 30 days of notifying offending OEMs. SPACE legal counsel is working on this one, at 'no charge' to suppliers.

CBS has begun routine feeds on T301 using transponder 2, to central time zone, after testing initially on TRs 1 and 11. This transponder should have good signals into Hawaii. ABC, meanwhile, has added TR6 on T301 for intra-net juggling of pre-feeds.

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SPACE Board meeting in Chicago, June 5th, decided to expand board to 25; 12 pioneers, 6 dealers, 6 distributors, 1 SMATV. No more consumers. Board also voted to shut future meetings off from public and press; Executive Director Hewitt, Counsel Brown and two members from Exco will do 'press conference' following each future board meeting. Proposal to shift all board seats to three year terms modified to two-year terms. Next meeting late in July in Washington.

PanAmSat is latest proposal to serve Central and South America, and, Caribbean. Satellite, using 24 C band and 12 Ku band transponders from proposed 57 west location, would be designed to function as 'international satellite relay' carrying news, educational, sports and entertainment programs. Hughes satellite would be used with 32/34 dBw footprint over region from Miami over all of Central America and south to Buenos Aires. FCC approval would be required; Intelsat is sure to oppose.

UK TVRO receiver manufacturer Satellite TV Antenna Systems (STVAS), led by **Peter Gray** and backed by the technical expertise of **Steve Birkill**, has landed a £416,000 investment from Lazard Development Capital. This funding will allow STVAS to move ahead with large scale production of 12 and 4 GHz receiver systems first displayed in Birmingham (England) this past September.

GTE SPACENET, due to begin regular service at 120 west as you read this, may take a 'little getting used to'. The satellite is both 4 AND 12 GHz and is the first commercial dual band bird for North America. Additionally, it is using 12 normal 36 MHz wide C band transponders on horizontal polarization, and, 6 wider-than-normal 72 MHz transponders on C band vertical. Power on horizontal is 8.5 watts (same as the hotter F3R and F4 transponders) while power on vertical is 16 watts. Some of the 72 MHz wide vertical transponders are expected to be run in a 'half-transponder' format allowing two separate TV signals (with audio), each the equivilent of a nominal 36 MHz wide channel, to share the transponder. 12 GHz channels are also 72 MHz wide and power is 16 watts.

WESTAR V will move, slightly, from 123 west to 122.5 west on or about 1 July. Note this will be but 2.5 degrees from SPACENET (SPN) 1, but W5 and SPN-1 odd-even transponders will be cross-polarized.

WPIX service, originally scheduled for W5, settled into a 5 year contract with F4 and is seen on TR19. This is one of the 'hotter' transponders for F4, since it (like F3R) has 8.5 watt transponders on 3, 7, 11, 15, 19 and 23. Scheduled for 1 July on TR21 of F4 is Dallas-Fort Worth independent KTVT, another 24 hour sports and movie station. F4's future is getting brighter.

W5 cable bail-out now about complete; Disney terminated feed here May 31st, exclusively Galaxy; BET did same earlier in May and TNN around June 15th.

G1 uplinkers like what they see; typically, they have been able to drop their uplink power from 3 to 5 dB because the on-bird 6 GHz incoming signal LNAs are hotter than the typical W5 and F3R 6 GHz front ends

JAPAN very disappointed with unpredicted failure of two of three

high power amplifier stages on new BS-2A bird. Bird was to supply first national satellite service channel, plus provide second channel for large scale experimentation with high resolution television and other 'futuristic' technologies. There were three HPA stages on board; two operational, one spare. One of these failed during check-out sequence, prior to May 1st dedication. Second failed 8 days after service was turned on leaving satellite with only one operating transponder after barely a week of operation. Failure came in French-built high power amplifier stages. Problems are considered major setback for Japanese industry plans to use bird signals to popularize 'quasi-DBS' television in Japan as both technology experiments and marketing trials.

SOVIET pullout from summer Olympics will have major side effects in television coverage and need for extensive satellite delivery of games coverage. Soviets have been major buyer of satellite (transponder) time both for use of U.S. domestic birds to link from L.A. to eastern USA 'gateway uplinks', and for transmission into Intelsat or Intersputnik systems. Overall level of satellite-fed games coverage will now be down as a result of the pullout.

CALIFORNIA Amplifier, which went 'public' less than a year ago, had a 573% increase in sales in most recent year and net profits amounting to \$2,630,000. Company is considered excellent stock buy at the present time with 17.4 cents of every gross dollar received retained as earnings (profit).

LAWYERS will have a new national 'continuing education program via satellite using 12 GHz bird space on SBS. The 'Law-Dedicated-Satellite-Network' will headquarter and uplink from Comsat in Washington, DC and an initial 24 downlink sites will be activated nationwide.

HBO 'long range' plans may well include ownership and operation of their own satellite(s). Knowledge that firm is already talking with potential satellite suppliers surprises few who expect HBO to continue to sit out any major involvement in the early-years DBS wars and then step in to pick up the pieces when the casualties are identified.

TED TURNER made it almost official when he announced that TBS will launch a 'European network' perhaps as soon as first quarter of 1985. Turner envisions network-channel made up of mix of CNN/WTBS and new sport's service programs, creating 'custom mix' that will be directly uplinked into Europe for re-distribution at 12 GHz. Service would be 'free' to cable firms eventually, would propably carry monthly fee per subscriber initially, with commercial advertising.

TURNER, meanwhile, is beefing up its stable of sports programming rights. They lost in bid to acquire ESPN (recently sold to ABC) but apparently have long-term plan to create and 'launch' a standalone sports programming service of their own; perhaps directly competitive to ESPN. Turner recently outbid ESPN for exclusive rights to NBA (National Basketball Association) TV coverage and he has made a large dollar bid for USFL rights as well. The sports programs TBS is lining up are far more than WTBS can handle in its limited single-channel schedule.

INDUSTRY AT LARGE

CORRESPONDENCE, NOTES, REBUTTALS AND CHARGES . . .

CSD provides this industry Forum with the understanding that opinions thoughts and "facts" published are from the writers, no liability for statements extends to the publishers. Address letters to CSD/Industry P.O. Box 100858. Ft Lauderdale. FL 33310

SPACE Army?

I am not a member of SPACE, and I never was. As I understand it, SPACE was created to legitimize our industry and allow us as indi-

vidual members of the industry to collectively fight off the threats to the

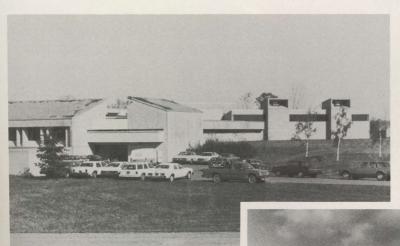
CORRESPONDENCE/ continues on page 57

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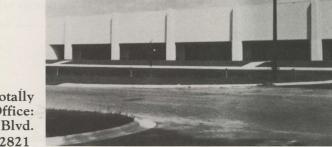
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WHAT DOES CHARLIE BROWN SEE IN CONIFER'S 12-FOOT MESH DISH?

After 95 Installations In Just 12 Months, Brown Is Sold On Conifer!

Out of his quaint shop in Knoxville, Illinois, Charlie Brown has become one of the most dynamic Satellite TV systems dealers and installers in the country. With over 15 years experience in consumer electronics, the last three years in TVRO, Brown knows how important quality products and service can be to the success of his business.

WHY DID BROWN CHOOSE CONIFER?

"When I first saw the Conifer DE-2001 system it was far ahead of anything else I had seen. The price point was better than anything else on the market. I had been selling comparable systems that offered the same features as Conifer's but they were selling for \$1500 more."

WHY DID YOU CONSIDER CONIFER THE BEST VALUE?

"Conifer had the features that I wanted to sell. Everything was contained in one unit...the dish drive, the Polarotor, one cable...everything. From the consumer standpoint it was very consumer friendly...from my standpoint it was fantastic!"

WHY DO YOU LIKE THE MESH?

"It blends in well with surroundings and looks better than a solid dish. You can install a Conifer black dish (AN-1200C) in a wooded area and it blends right in. Plus, the mesh offers much less wind resistance."

WHAT ABOUT INSTALLATION?

"After the base is set we can assemble the dish and have a good picture in less than two hours. It really helps that the aluminum mesh is attached to the petals at the factory. I've talked to other installers who use other types of dishes and installation times range from 2½ to 8 hours. If a guy is taking 7 to 8 hours to install a dish for the same money as I sell Conifer's system then he's taking less of a mark-up or he's selling a lesser quality system."

HOW DO YOU SELL AGAINST THE COMPETITION?

"We encourage people to go look and see what they're getting for their money. We have a competitor selling a smaller dish for the same price we sell the Conifer dish. There's no comparison in quality or performance. Once the consumer sees the difference for himself, he comes back to us."

HAS CONIFER LIVED UP TO YOUR EXPECTATIONS?

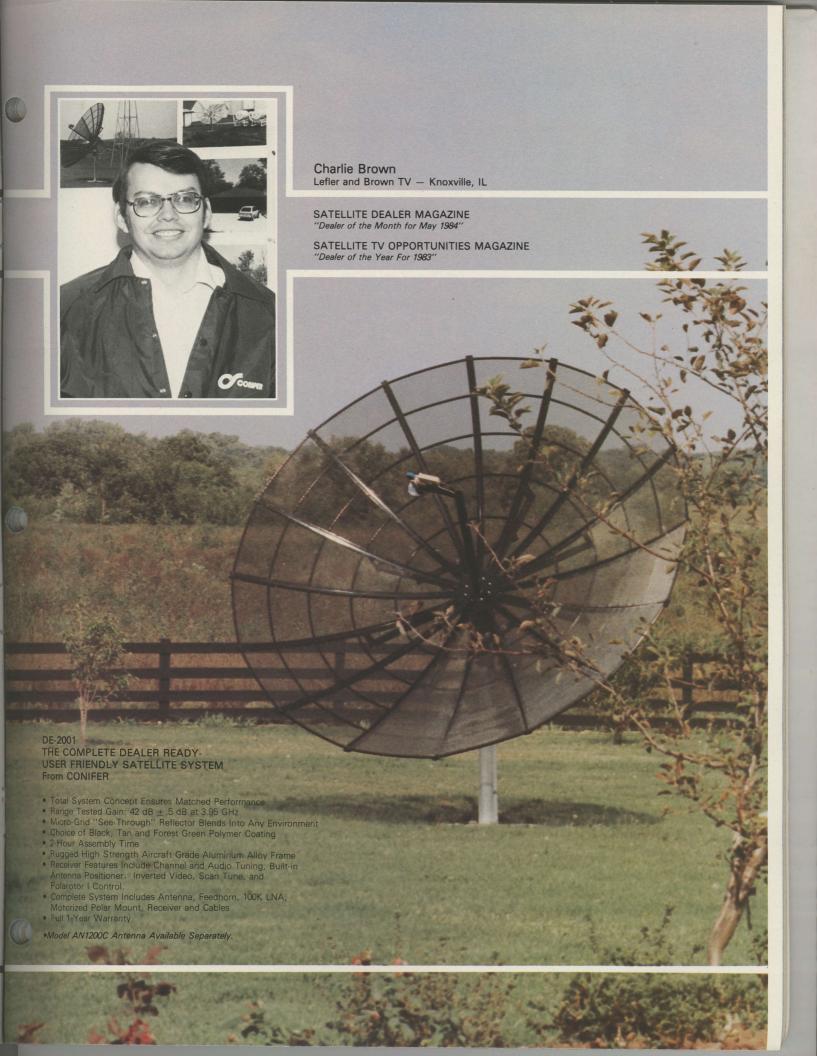
"The very first Conifer system I sold and installed I've never made a service call on. It works as good as the day it was installed. I think Conifer still has the best system and mesh dish on the market. No question about it!"

WHAT HAS CONIFER DONE TO HELP DEALERS BE MORE SUCCESSFUL?

"I highly recommend that a new or experienced dealer call or write Conifer to get a FREE copy of their new booklet 77 Ways To Succeed In The Home Satellite TV Business. It's Great!"

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At Last...



INTRODUCING . . .

The all new - -All in One Super Satellite Stereo Receiver from Boman Industries.

Convenience and style combined with the latest in TVRO technology makes the Boman Model SR2500 the receiver to which others will be compared.

Audio Group



Separate meters showing Signal Strength and Left - Right audio levels are provided with soft green illumination. Left-Right audio channel tuning is adjusted by separate controls. A balance control is provided for attaining that perfect *stereo* effect.

The pushbutton group consists of the "Discrete" and "Matrix" stereo buttons. Bandwidth is expanded by use of the "Wide" button. These three controls enhance the reception of all available audio transmissions.

The audio pushbuttons offer a choice of preset 6.8 tuning frequency for most video channels and variable audio for *stereo* or subcarrier reception.

The Detent Volume control adjusts the volume and adds to the attractive design of the *stereo* section.

Function Group



The attractive display panel shows channel number and polarity position in a soft green color.

The Format button transposes the polarity mode when receiving signals from the few satellites with reversed polarity signals.

The 12 GHz button changes the operation of the SR-2500 from

4 to 12 GHz when used with appropriate 12 GHz hardware.

DNR function provides a filtering of background noise from the audio thus providing very high quality audio performance especially on weaker signals.

A Search button gives a fast scan of all channels and is of assistance during the initial alignment and orientation of the programmable moving control.

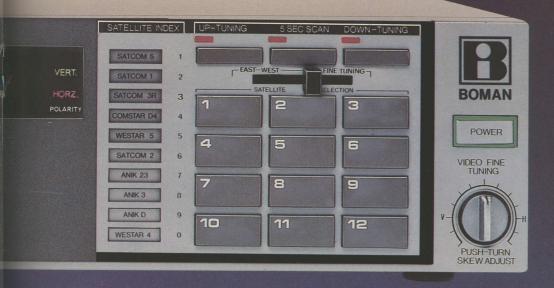
The Invert button is provided for reception of inverted video signals.

Satellite Selection Group



Satellite selection is accomplished with the 12 pushbutton pad

All In One.



The interfaced control then automatically moves the antenna to the pre-programed position.

A removable Satellite Index is provided which indicates the selected satellite. Up to 12 different choices of satellites may be illuminated individually. Additional satellite decals are furnished to provide a maximum of 24 satellite variations.

The East/West fine tuning control is used for that extra special antenna peaking which is sometimes required.

The "UP" and "DOWN" tuning buttons provide manual selection or scan of channels in 1 step or 2 step and continuous operation. The 5 second Scan button allows the user to view each channel for 5 seconds during the 24 channel scan.

Video Fine Tuning and Skew adjustment is made quick and easy using the dual function fine tuning control.

Other features found either inside or on the rear panel of the SR-2500 are:

- · Automatic Polarity Switching.
- Command Tone Response:

 A "Beep" audio tone is heard when
 any of the Feather-Touch pushbuttons is used.
- LNA/Down Converter power remains on when the unit power is switched off: No more LNA/DC warm-up drift.
- Integrated Channel 3 4 Modulator.
- 1 -2 Step Channel Advance Switch.
- Separate Sub-carrier Outlet.
- IF Gain Control.
- Cable Length Compensation Control.
- Parental Guidance Switch.
- Remote Control Switch.

MODEL SR-2500

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Affordable Stereo



All the Features and Performance of the High Priced Receivers

In spite of its modest price, the SR-1500 delivers video performance that can challenge any receiver on the market. And, it delivers *STEREO* sound for less than most monaural units.

This exceptional value is augmented by a list of features that makes a powerful statement about marketability:

- Built-in Stereo Processor
- Matrix/Discrete Stereo Selector
- Narrow/Wide Selector
- Stereo A & B Slide Control
- ■Vert/Horz Push-Button
- Skew Slide Control
- Format Push-Button
- ■L.E.D. Signal Strength Indicators
- *AFC Push-Button*
- ■Video Invert Push-Button
- Slide-Rule Tuning
- ■TVCH 3-4 Modulator
- LNA/Down Converter Voltage -Retained.

And, the attractive, slender design of the SR-1500 will make it a welcome addition to any family entertainment center.

If you think your customers are in the market for an exceptional satellite television experience featuring brilliantly clear reception, versatility, and value, you should be looking at the Boman Industries Model SR-1500.

It's the affordable Stereo receiver.

Boman Industries





Selected Distributors

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SATELLITE SYSTEMS Moore, OK (405) 232-8622

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STARPATH SYSTEMSJamestown KY (502) 343-3898
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Vancouver, BC (604) 877-1391

SIGMACOM SYSTEMS, INC. Whitby, Ont. (416) 666-1661

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In a world of complicated and temperamental dish drive systems, it's nice to know that some things remain simple. And dependable. One of these is the Surveyor III motor drive and control system from Boman Industries.

It's easy for you. - Plus total safety.

The control features a lock-lamp system designed to make programming simple. That means you'll save installation time. And its circuit design prevents memory loss due to power failure. The 36 volt motor drive features two adjustable limit switches for safety, 1500 lb lift capacity, and complete water sealing. That means you'll save service calls.

And it's easy for your customer.

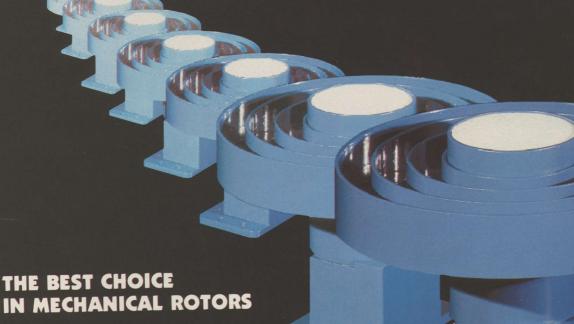
Interchangeable, illuminated index tabs correspond to sixteen programmable selector switches, making this control extremely easy to comprehend, and even easier to operate.

So, why not make life a little Boman Industries easier for yourself, with the model AMC101/460 motor drive and control system from Boman Industries. It's simple, and it's dependable.





NEW FROM M/A-COM OMNI ROTOR



- The only mechanical rotor with an adjustable scalar ring for optimum system gain . . . on any size dish
- The only mechanical rotor with an in-line configuration for easier installation and optimum system gain
- the only mechanical rotor with a cast aluminum (not plastic) motor housing to protect the motor from contaminants and moisture

The Omni Rotor also features:

- All aluminum scalar and housing for mechanical rigidity
- 0-180° rotation with fine adjustment
- Virtually zero insertion loss

Until today, installers who favored rotor-controlled feeds had only one choice. Trouble was, there was plently of room for improvement. Now, here's the better alternative: M/A-COM's Omni Rotor.

Omni Rotor is the only mechanical rotor with an adjustable scalar ring, for optimum system gain. The only rotor with an all cast motor housing, to protect your motor from freezeup, contaminants and moisture. And it's the only mechanical rotor designed in-line, to make installation fast, easy and accurate.

Best of all, Omni Rotor is manufactured by M/A-COM Omni Spectra, the most respected name in the





M/A-COM OMNI SPECTRA, INC.

Home TVRO industry. Other M/A-COM state-of-the-art Home TVRO products include the Omni Polarizer (with solid state control), 8' and 10' Prodelin reflectors, polar mount, receiver, LNA, LNB and cable accessories.

Take a look at the features of the Omni Rotor, and its price, and you'll agree: There's only one choice in mechanical rotors: Omni Rotor.

Check the adjoining strip for the authorized M/A-COM distributor in your area. Or contact: M/A-COM Omni Spectra, Inc. 21 Continental Blvd., Box C Merrimack, NH 03054 (603) 424-4111

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601-MO AVIT 800-406-

NEW Satel 603-8

Satel 518-6 OHI Sate

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TVRO Products Distributors

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Satellite Receivers, Ltd.

414-432-5777

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Channel One Video Corp., Ltd.

604-734-4966

ONTARIO

Banvil, Ltd.

416-878-8181

416-677-1410

SASKATCHEWAN

C.A.L.E. Communications, Inc.

306-949-9181

M/A-COM OMNI SPECTRA, INC.

CORRESPONDENCE/ continued from page 46

industry. This concept has a lot of merit and I cannot find any sound reasons to be against the concept. SPACE, in effect, is calling for the mobilization of an army where anyone who has an interest in our industry will have an input on the strategy to be developed. Fine. Where it does not 'click' anymore is how this army is being recruited.

For \$35 or so you become a solider; for \$300 you get to be a Colonel, and for \$XXXX you get to be a General. In other words, your degree of input is scaled to your contribution in \$\$(\$\$). Democratic? I wonder.

When money starts to buy a 'level of power,' there is corruption from the very start of the system. In my opinion, this is one of the major reasons why SPACE has been in so much trouble within the industry, and has drifted from its original goals.

I understand there should be 'structure' to this army. We cannot have an army where everyone is a general without chaos. The leaders should be recruited by their merits, their intelligence and their devotion to the ideals of the SPACE program; not for their financial contribution. SPACE needs a more democratic structure, or it should move to South America with Mr. Pinochet!

When the leaders become corrupted they start parading in their uniforms, ignoring the constituents. This could be one of the reasons why so many dealers are disgruntled, or refuse to support SPACE. They simply refuse to address the 'small dealer' who is, indeed, the backbone of this industry.

Frankly, I have very little real information directly from SPACE and in some honesty they may be doing things for the small dealer which I have missed. But I doubt it. I have never received any information (i.e. mailing) from SPACE nor has any of my suppliers ever sent me information concerning SPACE. I only know what I read 'in the trades.' I am responding to what I read in CSD for May 1984 because you asked for our input!

SPACE does have a BIG problem. The apple cart seems to have a few bad apples and that is threatening the entire apple cart. The first solution would be to throw away the bad apples to save the rest of the cart. As Coop suggested going from the inside to do this, through a democratic process, let me suggest that he is too much 'Mr. Nice Guy.' You have to act faster than this or the entire cart is going to spoil.

In expectation of retaliation, Coop wrote "I will feel compelled to write about their activities and make certain that the voters in the industry know the truth." Now I do not like the word voter. I do like the key word here; truth. Withholding truth is to be a participant in a conspiracy against the remainder of the industry.

Since I began dealing in TVRO systems, three years ago, I have religiously read Coop's articles. He has done a wonderful job to take each of us step by step through the technical aspects and since I have this occasion, I wish to thank him for his teaching of an industry.

But mostly Coop has been outspoken on certain issues. I admire having the guts to blow the whistle when necessary. Truth, it seems, has always been a major concern. You can understand my disappointment that you may be withholding (part of) the truth. I understand your reluctance to be a part of a negative political contest, but what about saving the rest of the apple cart before it is too late! It would seem that speaking the truth now will precipitate the process being initiated; to return to democracy for SPACE. You might even provoke some resignations NOW from some of the leaders of the present SPACE. Most of the dealers are looking to you to get us out of this mess!

I would like to suggest an approach to do away with the bad apples. How about a boycott of their products by the dealers and distributors? If these people cannot be honest in their dealings on the Board of Space, where they purport to represent us, what makes us think they can be honest in their dealings with dealers and distributors? It is time to clean our dirty laundry; let's do it together!

Henri Guerin New Mexico Satellite Rt. 9, Box 86DD Santa Fe, NM 87501

First a defense. We never meant to suggest that we WERE (presently) withholding information. What we DID mean is that if there is some type of 'dirty tricks' approach, by those presently in

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power, to 'retain' their power, we'd not hesitate to report it to the 'electorate' (we don't like voter either). We've written just about everything significant we can about this subject to date and have no sleeping 'bombs' to reveal at the present time that have any bearing on the issue at hand. Now, as for boycotting those firms who are represented by the board; that sounds pretty strong to us (perhaps we are 'Mr. Nice Guy' afterall). At this stage, we prefer an open and above board attempt to simply 'take over the SPACE board' through the electoral, democratic process. We will succeed IF sufficient people really care what happens to our industry. When something about this industry is written or reported, it is SPACE that gets the quotes; not you and not me. As long as we have SPACE being quoted, SPACE is 'the spokesman' for an entire industry, whether you belong to SPACE or not. The SPACE story is the ONLY story heard. It seems important to us that this 'single spokesman' for home TVRO be saying 'the right things' and that alone is a sufficient reason why we must, as a trade group, straighten out our own affairs internally.

U.S. SPACE-view

I attended the San Jose SPTS in July of 1980 and this was the first, formal 'meeting' for SPACE. At that time I asked the same question which Coop asked in the interview with Mr. Hewitt which was published in CSD/2 for May 15th; namely, "What about the by-laws???".

SPACE has NEVER been a grass-roots organization and never will be until that question is answered. That is to say, until an individual at the 'lowest' level in the organization has a part in making policy and impacting the organizational form, there can never be an effective SPACE. A properly formed, properly adopted set of by-laws will provide the means for that to be accomplished.

I WAS an active, concerned member of SPACE that first year and when the industry was threatened by HBO incited legislation that first fall, and SPACE sounded a call-to-arms, I instantly called my representatives to ask them to help us protect this exciting, new, technology. You may recall at that time it was widely rumored that Radio Shack was planning to sell TVRO systems. I even called the President of Radio Shack to tell him about the threat and asked him to use their influence to help us with this battle.

But as time ground on it seemed that the benefits to me, as a struggling dealer, were no longer there. I do not remember ever being asked to vote on any issue, or for any of the officers so when they raised the dues to \$300 a year I simply dropped out.

My whole point is this. The current problems in the SPACE organization can be traced back to the 'start' and Bob Cooper has to accept a large part of the blame. Coop was there; it was his child, and he didn't raise it right! And I, and other pioneering dealers, have to also share part of the blame because we dropped out rather than fight to set it straight back years ago.

But it seems to me that if SPACE is to EVER be the organization that it should be, first the organization needs to answer the question 'Where are, and what are, the by-laws'?

Donald L. Vester ASTCOM P.O. Box 936 Chatam, Al. 36518

Coop accepts his share of the blame for the present state of SPACE. And he recognizes that those who have never joined, or those who did join but who dropped out, must also share the blame since there cannot be input to an association if you do not belong to it. Standing outside, calling the present organization 'corrupt' or something equally unflattering is not adequate. If you believe in the need for a trade organization, and there is one already in existence, first you try to change it from within. If that fails, well, we move to step two...

AUSTRALIAN View On SPACE

I feel I must comment on the 'goings on' within SPACE. With no reason to doubt the accuracy of your reporting, I feel I must echo the feelings of those outside the USA who look to the U.S. industry to provide a lead to the more fledgling TVRO industries elsewhere. It concerns me that this (worldwide) industry has so much in-fighting,

and how bad that looks in print.

Our company has been a pioneer in the 4 GHz business in Australia, but like everyone else in the world we have had to turn to the USA for technical expertise and certain pieces of equipment such as LNAs.

Because the industry does not have a united face to the rest of the world, and because of the sometimes wildly exaggerated claims of some manufacturers, I am now apprehensive about sourcing new equipment from the other side of the globe. It is very expensive to jump on a plane each time you need information from a potential supplier; but how are you going to find the truth unless it is in a face-to-face confrontation? The alternative for us is to buy one-each of every new product and do our own side-by-side testing using INTELSAT or PALAPA bird signals; alas, this is also a very expensive process.

SPACE should be presenting a mature and responsible image offshore, and dealing with a MEMBER of SPACE should evoke a feeling of confidence. Perhaps SPACE should have a few more Board members from firms such as Patmar, who do not have a vested-interest in one single product or product line, to present a more balanced outlook. It is too democratic to suggest that EVERY member of SPACE should have an EQUAL vote and pay EQUAL subscriptions?

Although CSD concentrates on the US scene (which is, afterall, where 'the action' is), there is still an excellent smattering of world news. So what about a worldwide association, say IMDOSAT (International Manufacturers and Distributors of Satellite Terminals) with membership open to all manufacturers and distributors of TVRO and ARO equipment around the world? Further, to limit its domination by firms who ONLY have an interest in the domestic U.S. market, membership could be limited to those firms that produce equipment suitable for the international market.

No Board of Governors; just a committee directly answerable to the Association as a whole. One standard association fee (\$200 US per year?) and EQUAL VOTING RIGHTS for each member. The primary aims would be the exchange of ideas and technology, and a representative voice in dealing with the Intelsat and Domsat operators of the world to try to influence some orderly development of satellite 'broadcasting' worldwide.

If you think all of this sounds like the incoherent ramblings of a fool, please consign this letter to the rubbish bin. If not, I will be the first to send in my check for \$200 because as I see it, only someone in Coop's position would be capable of coordinating the formation of such an Association.

David Keirnan General Manager Homesat TV Pty., Ltd. P.O. Box 37844 Winnellie, N.T. 5789 Australia

Hold onto your \$200 (US). There is absolutely nothing wrong with your concept and it may well be the proper answer to the 'SPACE problem.' Give us the opportunity to attempt to straighten SPACE out from within. When the dust clears in the next 90 days or so, if things are no better, or worse (God forbid) then we'll probably move in the precise direction you suggest. And ask Arthur C. Clarke to be our President!

ANOTHER Australian View

Our copy of **CSD** for May just arrived and I have finished reading it through. I am concerned to hear of the problems within SPACE, particularly with regard to its moralities and ideologies. We can appreciate your stand and why you have made the decision set out in the May issue. You have our support and should we be able, in any way, to lend any support please let us know.

Olga and I would also like to join the fall tour group. As you are aware, we are both totally involved in the satellite industry here in Australia. We are seeking to gain experience and the best way we know to do this is to try to learn from the North American pioneers, and those elsewhere in the world. You will appreciate that with our primary service on INTELSAT, we in Australia need the knowledge that is gained at the **international** level. Those interested in the Australian domestic market are slowly getting to know one another and we hope to develop a viable satellite industry here. As the numbers increase,

OUR GROUP OF DISTRIBUTORS IS READY TO SERVE YOU

The International Satellite Distributors Association supports their dealers with personalized service before and after all sales. We handle warranties, delivery from local inventories and a full line of quality products with accessories for commercial and consumer satellite systems. Other services include directional advice, distribution of sales literature and referrals. We sell only through dealers. This is what makes local distributorships superior.



Contact the International Satellite Distributor nearest you.

Satellite Video Distributors, Inc. P.O. Box 5145, 1005-A E. Hwy. 83 McAllen, TX 78501 Contact: Bill or Peter Wylds (512) 682-4501

S.R.C. Industries 773 S. Oregon St. Ontario, OR 97914 Contact: Stan Leaf (503) 889-7261

Wholesale Electronics Supply 507 Pressler St. Austin, TX 78703 Contact: J. P. Pat Patterson (512) 478-9568

Paar Industrial Electronics, Ltd. 4531 Manitoba Rd. S.E. Calgary, Alberta, Canada TZG4B9 Contact. Devid Graham (403) 278-2840

Horizon Satellite Systems Route 1 Brookstone, IN 47923 Contact: Brad Van Holten (219) 279-2511 Avsat Distributing, Inc. 500 B. South Lake Blvd. Richmond, VA 23236 Contact: Andy Hatfield (804) 794-8800

Cumberland Electronics 642 So. 20th Harrisburg, PA 17105 Contact: Robert Clave (717) 233-5883

Satellite Video Systems 7520 Washington Kansas City, MO 64114 Contact: Allen Cook (816) 333-0315

Bellis Electronics Botel Road Savannah, TN 38372 Contact: Johnny Bellis (901) 925-4787

Satellite Dealer Supply, Inc. 690 Lindbergh Dr. Beaumont, TX 77706 Contact: Stan Price (409) 842-0954 Wright Technology Mktg. 200 Wisteria Drive Hattiesburg, MS 39401 Contact: Orby Wright (601) 545-2545

Satellite Electronics, Int'l. 960 Matley Ln. Reno, NV 89502 Contact: Bob Godfrey (702) 329-6611

Earth Terminal TV, Ltd. 155 Bemis Raod, RFD 12 Manchester, NH 03102 Contact: Mike Mountford (603) 625-6659



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we would like to set up an organization for the benefit of the industry here. We, truly, are one of the pioneers here.

Doug Sawtell
ACESAT Satellite Receiver Corp. PTY. Ltd.
856 Princes Highway
Sutherland 2232 N.S.W.
Australia

As plans finalize for this fall's tour to Japan, China, Hong Kong, Singapore and Jakarta, we will keep you advised of the itinerary.

TOO HOT To Handle?

I have followed satellite television since Coop's first publication and have attended most of the TVRO shows. And, I have been selling TVRO systems for over three years. The region where we have been concentrating our efforts includes South Bend, Mishawaka, Elkhart (Indiana) and Niles (Michigan). The economic base here includes about 250,000 people.

Prior to June 1983, there were no more than 26 dishes in this region. And I had two of these and my competitor had two (making 22 'real installations'). About Thanksgiving of this last fall, the market

I was in Miami when Coop first proposed an organization which would eventually become 'SPACE.' It seems to me that SPACE has drifted away from its original purpose. Back in Miami, and after, nothing was said about dealer and distributor groups within SPACE, trade shows, SMATV and other areas which SPACE has attempted to dominate. SPACE, today, exists for the convenience of a handful of large TVRO manufacturers. I was at the dealer organization meeting of SPACE in Omaha and I heard what SPACE was going to do for the dealers and distributors. So far, we have contributed quite a sum of money to SPACE and received nothing from SPACE; oops, excepting of course CSD/2. My thanks to Coop for making that possible!

I have questioned the why's and wherefore's of SPACE for sometime. What has happened to the code of ethics, the uniform testing procedures, interchangeability, specifications and on and on and on? The members have not seen **any** of this; all we get or hear are legal briefs and problems from a law firm which runs (or ran) SPACE, and the legal issues they have raised.

The word that is lacking here is 'integrity.' From the manufacturer, to the dealer. Manufacturers and distributors are not upholding a businesslike posture with their dealers. Manufacturers are continuing to make inferior products. Selling directly to the consumer happens ALL of the time; protected areas is a bad 'joke.' Thirty day credit; what is that! Many firms still require up-front money and when a manufacturer holds \$50,000 for two months before shipping his product, the poor little dealer gets hurt badly.

And then we have dealers who don't know a certain part of their anatomy from a hole in the ground. Case in point, which I personally witnessed. A new local dealer is selling D&H spun dishes. Good dish? How about if it is NOT painted and it is factory-shiny like a mirror? Not long ago one of the new dealer's installers smelled something hot. He looked down on his shirt sleeve and it was smoking; the dish had set him on fire! When this dealer was asked about SPACE, he said 'space-what???'.

The satellite industry is a real mess — RIGHT?
Paul A. Boggs, Jr.
Michiana Satellite Systems

177 Fir Road Niles, Michigan 49120

You called it. Is it worth saving? Have we had sufficient 'blood letting' to get on with the task at hand; patching it all back together in an intelligent manner once again? We'd like to try. Anyone willing to roll up their sleeves to help?

UNQUESTIONABLY Legal

Two years ago the British Columbia Utilities Commission, acting under the mandate of Provincial Government Orders-In-Council Numbers 193 and 194, asked all parties engaged in elements of the communications industry (specified in those orders) to 'apply for certification.' Our corporation was the first to apply, and, the first to receive a certificate.

Our certificate, number T2 and dated October 1st (1982) and issued in the name of our President, Frank Ogden, includes authority to operate an 'electronic library.' Copies of the certificate, the Order-Of-Council, and the published public notice are attached for review.

On June 12, 1982, **BCTV** ran an item in their prime time evening news broadcast claiming that Frank Ogden and 21st Century Media Communications Corporation, Inc. had violated their copyright and they would take legal action to halt the 'video monitoring service' being provided by Ogden and 21st Century Media Communications, Inc. A writ dated on the 20th of July was issued in the Supreme Court of British Columbia and examinations for discovery were scheduled. After the initial examination of Frank Ogden, no further action was taken by BCTV.

After more than a year of waiting for BCTV to proceed, application was made to the Supreme Court on April 14, 1984 to have the action of BCTV dismissed. BCTV ultimately consented to the dismissal of the action. A copy of that Order is attached.

It is important to note that we provide our service in a planned and precise manner that has been reviewed and approved by our legal counsel in British Columbia, Ottawa, and the State of Washington. We do not duplicate and sell (video) tapes!

To our knowledge, no other company in North America offers a service comparable to that presented by Ogden and 21st Century Media Communications in terms of attention to precise legal requirements, and such wide-ranging coverage. And no other firm in North America is legally licensed and sanctioned to provide such a service. Ogden and 21st Century, to this date, hold the only such certificate covering the service ever issued by a governing authority.

Ed Hawkes Senior Vice President 21st Century Media Communications, Inc. 548 Cadero Street Vancouver, B.C. V6G 2W6

Ogden's firm is indeed unique. Using a bank of video tape decks, they record off-satellite (and off-air) newscasts from dozens of sources. They have a list of corporate, government and private clients who contract with 21st Century to provide composites in various areas of interest; say everything on television in the past week dealing with the salmon fishing industry, or, nuclear warheads. Each week Ogden sends off composite tapes to his clients edited down to just the pieces they have an interest in. This 'electronic/video' clipping service provides a real service to people who have a need for data in a specific field.



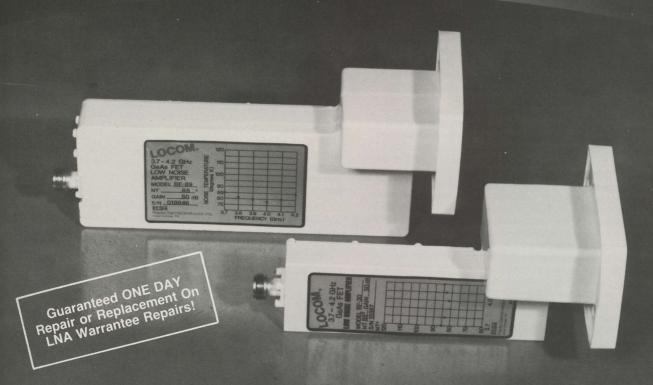
OGDEN at work in Vancouver during a recent visit by Coop

SICK Of Shows

Trade shows have become a big disappointment. Disregarding the recent SPACE/STTI controversy, the most recent shows have been filled with fly-by-night exhibitors who sucker unsuspecting buyers into making purchases that they cannot or will not deliver, or

RADIO SEMICONDUCTOR

From the Company that first introduced the Professional HP 8970A test set to the TVRO Industry (See "Coop's Satellite Digest" Feb. 1983) comes Professional Reliability!



STRESS TESTED FOR HIGH RELIABILITY!

LOCOM LNAs are stress test under the following environmental conditions:

- We perform a Commerical burn-in, on all LOCOM LNAs.
- We analyze the microwave performance, including linearity, gain and bandwidth, at −10°F, on all LOCOM LNAs.
- We analyze the microwave performance, including linearity, gain, and bandwidth, at + 130°F, on all LOCOM LNAs.
- We leak test to detect and correct pin-holes (which allow corrosion-related failure), on all LOCOM LNAs.

These professional tests are performed on all LOCOM LNAs to insure that they last, and last, and last.

VERY LOW NOISE!

LOCOM LNAs are the best value for very low noise.

NEW MODEL: 50dB, 120° to 70° NT-Model RF-900 NEW MODEL: 44dB, 120° to 75° NT-Model RF-910 Radio Semiconductor, Inc.

315 Benner Pike, State College, PA 16801 U.S.A. Tel: (814) 238-2133 / TWX 510-670-3640 RADIOSEMI (800) 233-3028 (Outside PA)

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provide back-up for the products sold. The 'technical seminars' are virtually worthless if you have been in this business for more than a few weeks. In Las Vegas, I spent 30+ hours in seminars. For this I gained perhaps 2 hours of knowledge and most of that came from Coop during the downlinking course at the SPACE show. SPACE and STTI should have clearly marked 'novice' and 'advanced level' seminars and they should be run without hyping specific products.

Richard Lowman Berkeley-Sunwood 100 East Road Martinsburg, WV 25401

Dealers who feel this way should make their complaints known directly to show management. A few key phrases would include "... if you don't change the way you allow seminars to be run, I am not going to attend anymore of your shows." If this phrase was heard often enough, from a significant number of people, the seminars would be re-directed. On the other hand, if you don't really mind them the way they are, and keep quiet, you will continue to get just exactly what you have been getting.

WE DON'T Build Dishes

There appears to be some confusion regarding our role in the satellite TV marketplace. In your CSD/2 for April 15th, you published that we have an involvement in the creation of dishes for the USCI 12 GHz field. This is correct, but there is the suggestion I think that we actually manufacture dishes.

In CSD/2 you wrote "(Owens-Corning Fiberglas Corporation) entered the parabolic materials business with glass fiber reinforced composite antenna design." Many (many!) dealers and manufacturers interpreted this comment to mean that OCF manufactures antennas. We do not manufacture antennas.

Owens-Corning Fiberglas Corporation is a manufacturer of glass fibers and polyester resins. These materials are purchased by corporations such as Eagle Picher, who combine these components with several other ingredients. This mixture is molded under heat and pressure to form a reflector and that reflector is sold to M/A Prodelin, Inc. who manufactures the antenna assembly and distributes it to General Instrument.

Owens-Corning's role as a material supplier is only to promote the use of glass reinforced composites versus competitive materials (such as steel, aluminum, etc.) at the end use level.

James S. Blaszczyk
Market Development Manager
Equipment Manufacturers Marketing
Owens-Corning Fiberglas Corp.
Fiberglas Tower
Toledo, Ohio 43659

... and General Instruments delivers the 12 GHz dishes to USCI who ships the dishes to RCA Service Corporation who distributes the dishes to their regional installation centers who install the dishes on homes for those poor suckers who have laid out \$295 or \$495 or \$795 (or whatever the 'price special of the week' may be for USCI service) to have 'satellite television' in their home. Ultimately, OCF may be very glad they are NOT manufacturing 12 GHz dishes for this bunch. Eagle-Picher may well end up 'eating' a warehouse or two filled with these dishes for lunch.

POWER For The TVRO

According to the **Atlanta Journal** (newspaper), the Electric Membership Corporation (a public utility in Georgia) plans to offer TVRO systems to their customers. The newspaper article reports that EMC views home TVROs as a suitable substitute for rural electric customers where because of the thin housing density (they say under 5 homes per electric plant mile) cable television will not pay for itself (one gets the idea that if cable would work there, EMC would **now be offering** cable TV). They began a pilot program during June to survey how many customers would take the home TVRO system from EMC. They claim to have nearly 750,000 rural electric customers in Georgia and they also claim that if the project works well in Georgia, they want to expand it to '46 other states.' Naturally I fear being in competition with a state electric co-op that is selling TVROs either state or nationwide. I can see how some would like this idea, but for me, the small

dealer, it could be a disaster. They could out-promote, out-sell, out-finance and out-install me at every turn. I contacted SPACE about this and hope they will do something.

Mick Moore, President J&J Satellite T.V. Systems 9504 Tara Blvd. Jonesboro, Ga. 30236

That's what we need most this month; some giant electric utility stuffing 750,000 electric bills with an offer to rent, lease, or buy a TVRO from their friendly meter reader! We notice that Georgia Lt. Governor Zell Miller appointed 11 state senators to 'board' to study the concept. That'll screw it up good; turning it into a political football. Worry not . . . when is the last time you saw a state-run bureaucratic agency be cost competitive with private industry?

ILLEGAL (?) In Nipawin

Most of the U.S. readers may not take this as serious. Some Canadian readers may also figure it does not concern them. I think this concerns anyone who believes that every American and every Canadian should have the right of access for satellite television services.

First we have the Satellite Television Industry (STI). And then we have the 'feds' (DOC or Department of Communications). A war has been declared and the DOC is deliberately preparing to engage the enemy; the STI. The winner of this war will control, perhaps for decades to come, the minds of Canadians everywhere because the outcome of this war will determine what communication sources the people ultimately will be able to access.

Last year was a disaster. Why? Because the STI felt they had 'won the war' for independent television viewing in Canada and after the skirmishes of '83, we went around congratulating ourselves and one another with what a wonderful war it had been; and after all, we won!

Well, not quite. In fact, the 'war of '83,' fought in the courts (Winnipeg Holiday Inn case and others) was not 'the' war. In fact it was not even 'a' war. It was barely a skirmish. What the Winnipeg Holiday Inn decision (which was basically on the side of 'the people') did was to alert the DOC that they had better trot out their heavy guns and artillery, end the skirmishes, and polish us off once and forever in one massive retaliatory action.

Which brings us to Nipawin. A small town, located near Arborfield and Choiceland in far northern Saskatchewan. Nipawin is special. It may be likened in some ways to the 'battle at Bunker Hill' in the first war of independence in North America, in years ahead.

Nipawin has 5,000 people living there. They had one TV channel, courtesy of the CBC, so they got together and started a fund raising drive. They raised enough dollars (Canadian dollars, at that) to purchase a satellite receiving system, rent use of a tower, and, some transmitting equipment. They displayed this at the local, municipal, fire hall

They held a series of public meetings and they voted on which satellite signals they would receive. HBO and WTBS 'won' the vote and pretty soon those 5,000 in-town residents plus a handful of others scattered across the prairie within perhaps 20 miles or so were watching HBO and WTBS through a local low power TV transmitter. The service was pretty good, too.

Well, things rocked along pretty good for a couple of years. Now, along comes a new firm called Image Cable Company and they make federal application to build a cable TV system in Nipawin. After all, the satellite fed re-broadcast system had introduced TV to the town and now that everyone had a TV set, which was supported by a few bucks per family per year for routine maintenance, why not step in and profit from all of this?

The CRTC granted Image Cable a license and Image Cable turned right around and filed a formal complaint. They wanted the town-funded and town-operated two-channel TV system shut down. Instantly and completely. They had a pretty good case; the town of Nipawin had not asked for a transmitting license for its two TV channels and in fact had they done so, the DOC would have turned them down anyhow because they were electing to re-broadcast a couple of those 'nasty' foreign, un-Canadian TV signals. HBO and WTBS to be specific.

So into Nipawin rides a member of the Royal Mounted Police

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accompanied by a communications lawyer from the east. The mountie had a search warrant and he grabbed all of the written records (who had donated money, how much each had donated, and therefore who the financial backers were); and, he carefully recorded the serial numbers off of each piece of equipment in the system (so they could be later properly identified in court). Then the attorney from the east spoke. He told them that after that very day, if the group did not elect to turn the system off (as he and the mountie were urging), the 'town' would be subject to a monetary fine of \$1,000 per day for each day the system continued to operate. One had to suspect that lurking in a corner was a member of Image Cable Company ready, willing and anxious to 'record' each day the system stayed on the air after the lawyer left Nipawin.

They say the mounties always get their man. In this case the mountie has a problem. He lives in Nipawin! He watches HBO and WTBS (well, he did) and his family has to socialize with the other 4,996 people who also live there and his kids have to go to the school ... you get the picture. He was a brave man. I would have turned in my badge!

The lawyer, meanwhile, simply flew out and returned to the safety of 'the east.' Lawyers are like that.

So here we have the little town of Nipawin entering the front lines of the war for 'viewing independence.' They did what any small town in the same situation would do; they called a town meeting. **Seven hundred people showed up,** or at least crammed into the meeting hall. No more could get inside. They elected an 8-person board to deal with the situation, fired off some communiques to some politicians, and they hired a local lawyer. All of this sounds appropriate.

Contacting politicians won't hurt. Holding a mass meeting can't hurt. Hiring an attorney, even a local one, may put them at a disadvantage. For Nipawin, the actual war was over the minute the lawyer came to town. Because he knew 'the law' even if the local people did not and even if the mountie did not.

Section 29-3 of the Broadcast Act.

It says that the people of Nipawin, no matter how noble their cause or how difficult their plight, could not be running around sticking in TV broadcast transmitters without a license. Of course had they followed the regular system and filed an application for a TV broadcast license for their two channels, they would have found that such a license would not be granted simply because 29-3 will not allow you to rebroadcast a foreign (read American) satellite TV signal.

So the Nipawin committee formed a new committee and they formed a new non-profit corporation. They are filing for a broadcast license with the federal government. Which they will **not be** granted.

Under Canadian policy, if there is a suitable local service already in existence, no such licenses will be granted EVEN IF the license applicant only wishes to rebroadcast Canadian (source) signals; as opposed to those 'nasty' U.S. source signals. There is **already** a 'local service' in town; **Image Cable Company.** It does not matter that it was not there when Nipawin first installed their two channels of TV transmitters. It is there **now**, and as a **legal entity**, it pre-dates the rebroadcast service.

Nipawin has lost. Before they have begun. There are perhaps 200 'other' Nipawins scattered throughout remote Canada. They too, ultimately, will also lose if they find themselves in a community where a licensed cable service has set up shop. As long as a community has no other commercial service (CBC relays don't really count), these rebroadcast service facilities may well endure. But as soon as a cable firm spots the community, and obtains a license, the rebroadcast service is a goner. The law protects the cable firm from 'competition' and it does not protect 'the people'; even when 'the people,' such as in Nipawin, are 'doing their thing' in a straightforward and democratic way to the mutual benefit of all in the area.

That cable will never serve those rural farmers surrounding Nipawin, and that the rebroadcast facility did, does not count. The law . . . is the law . . . is the law . . .

And through the law, applied perhaps selectively, ultimately the Canadian game plan calls for total control, community by community, of all of the mass entertainment, information, and education programming. Only those who somehow manage to hold onto their **private**, home, TVROs have a **chance** of being 'independent' of this national, imposed, control.

The solution is what I have been preaching for several years now. Years ago, given a Nipawin situation, people would have turned out with Ax handles and shotguns to protect their TV system. They may well go to the streets again (as they have in other Canadian communities) but this is, I suspect, less and less likely to happen each year.

If we find ourselves in a position of dis-liking a law, and wanting to change a regulation these days, there is really only one acceptable method to accomplish this. First we rally together for the strength of unity and mass. Then we petition our elected politicians for change. We make it very plain to them that UNLESS certain laws or regulations are changed, they (as individual politicians) shall not be returned to power. This may sound 'terribly democratic' but believe it or not it can and will work. Most politicians grow fond of 'the good life' and when something threatens that lifestyle they become very nervous. The job of the Satellite Television Industry, in Canada, right now is to make as many politicians 'nervous' as possible.

There is a trade association in Canada; C-SPACE. I have served in the capacity of being the front man for C-SPACE for quite some time now and I must say that much of what I have said and re-said about a doomsday is now remarkably close to happening. If the Canadian TVRO industry is going to survive, it must become a unified industry capable of handling the future Nipawins of Canada. Each victory for the DOC will chip away at the tenuous foundation the pioneers of this industry have built-up over the past five years. C-SPACE, I... the users of terminals need the unified support of an entire industry right now. Please let me hear from you today!

Christopher Budd C-SPACE 199 N. Leonard Regina, Saskatchewan S4N 5X5 Canada

We endorse the C-SPACE concept and the efforts Budd has put forth to hold the Canadian industry together. Canada has had it pretty good for several years. Budd is right; the tide is changing and unless Canadian members of the industry unify to handle these problems, the feds are going to take the industry apart piece by piece, dish by dish, until there is no industry left.

FLUBBED Fluke?

Regarding the report on page 8 of **CSD** for May. It seems that both the Radio Shack autoranging multi-meters (models 22-1960 and 22-192), and, the Fluke model 82-RF (RF heads) you listed as companion pieces for accurate measurement and monitoring of TVRO 70 MHz signal levels are discontinued models. The Radio Shack digital multi-meters seem to come and go (by model number) with great regularity and there is no doubt a current model in their stores which is the functional equivalent of either the 22-1960 or the 22-192. The more difficult part to obtain would be the Fluke RF head. The current model is their **Model 85-RF** and according to Trice Wholesale Electronics (Oklahoma City) it is a direct replacement for the older model 82; at a price of \$85.

I have a USS/MASPRO SR-1 with my ADM-11 antenna demo trailer rig and as CSD suggests it is a shame not to make better use of the SR-1's built-in highly accurate metering function.

I would like to suggest that somebody come up with a simpler, less expensive, RF detector which can be used with virtually any sensitive multi-meter.

Has anyone built up such a meter sampling device and worked out the values and diode selection?

Stan Jeffcoat Jeff's Electronics 612 S. 10th Street Yukon, Oklahoma 73099

We 'flubbed' the Fluke (and Radio Shack) model designations. We've been using the Fluke head for metering for years and it never occurred to us that everyone else was not. When several recent visitors leaned over our shoulders as we were aiming dishes and said, "Hey ... what's that!" we decided it was time to share the information. The Model 85RF head is a suitable substitute for the older Model 82. Oh yes, USS/Maspro (St. Hilaire, Mn. 56754) has a fair stock of brand new Model 82 heads for those who

don't have a Fluke distributor nearby, as Jeff does. Building a field strength meter for 70 MHz is simple enough; but you might want to contact Channel Master and ask for literature on their model 6198 'Carrier Level Detector.' This fits into an anodized splitter housing (making it small enough to fit in your shirt pocket easily) and it has three F fittings and two banana jacks on it. One F is for RF in from the downconverter, another is for RF out to the indoor receiver, and a third for the connection of a real-world 'power meter.' The banana jacks are for plugging in an analog or digital meter. We tried it here (after picking one up at Channel Master) and found we had a 5 to 7 millivolt reading using an SR-2 receiver with 70 MHz flowing through it, through the 10 dB down (-10 dB) test port on the SR-1. Our suggestion is that people quit screwing around and just locate a decent digital VOM and a Channel Master 6198. Least expensive way to go, best accuracy, and maximum versatility.

ATTENTION Receiver Manufacturers

During Coop's last visit to Omni-Spectra (see CSD for March 1984) we mentioned we would be coming out with a new controller in the 'near future.' This device would be a single-switch control, multistorage capacity with a protection circuit so that it could not burn out or damage the rotor. Basically, it had alot of 'bells and whistles' and the 'bells and whistles' brought too much cost to the unit. We now feel that it was 'overkill' and after building 500 'proto-types,' we have decided not to bring it to market. Instead, we will be offering a controller that is a bare-bones type manufactured for us outside.

Our feelings are that the receiver manufacturers will be offering this option of polarization control and a separate device with a cost of \$50(+) has no real future in the marketplace. We would like to make the offer to any receiver manufacturer that is willing to place the control of the polarizer and the rotor in their equipment that Omni-Spectra will supply the engineering time and circuit layout to them, for this function; in return for a mention in advertising (or endorsement), or preferably an order for polarizers(!).

We have a number of different layouts and circuits available with storage capability, servo protection, and a few other functions. We are making this offer in an effort to help the industry accelerate in its growing process and hopefully to create a more reliable system for the end user, and fewer service calls for the dealer.

Donald C. Cloutier Sr. Development Engineer Omni-Spectra, Inc. 21 Continental Blvd. Merrimack, N.H. 03054

Manufacturers interested in a full 'bells and whistles' polarization control and memory system for their next model of receivers are encouraged to talk with Don directly (603/424-4111).

WARRANTY Policies Challenged

'We guarantee our product ... no matter what it costs the

What is a dealer to do? He buys a Luxor receiver from a distributor and it doesn't work. Where does he send it for repairs? What about a General Instrument? Or one of the 'Entertainer' units? What about a Proline? Or a Drake or Automation Techniques? Astron? Haaa!

Every manufacturer wants to sell you his product but nobody seems willing to guarantee it. Yes, they all have their little, limited warranties. If it does not work, the dealer is supposed to send it back and they will repair it for free under their warranty. But just try to send something back!

First you have to make a long-distance telephone call for a return authorization. That is a minimum of \$2 because they always place you on hold. If you neglect to get the return authorization and simply ship the unit back, you will pay to ship it to them, and pay to get it back; refused. Then you will start all over and do it the 'right way,' starting with the telephone call. Most items sent back for repair average two months in the repair cycle.

It is always shipped back COD for freight charges, never pre-paid. If it is not fixed properly, back to the telephone for another return authorization and then another UPS charge; both ways. This time you may even get 'lucky' and push the unit past the 90 day warranty period, so you end up with a service charge as well(!).

The 'best' one is Avantek. They have a policy that charges you \$75 for LNA evaluation if it turns out the LNA was not broken. I guess they expect every TVRO dealer to have a \$15,000 LNA test set. If they flub on the test, and charge you \$75 to evaluate it, you get it back owing them \$75 and you still have a broken LNA. At this point it is cheaper to throw away the LNA than to fight with them again. I will not sell Avantek LNAs for this very reason. So far the other LNA suppliers have not started this practice; thank God!

Hytek has given me the best technical support and the best service. Omni-Spectra's Bruce Smith is another 'good guy' for technical advice and support. I have never been able to get past the secretaries at Chaparral. And after 25 telephone calls all over the United States, I have yet to learn how you get the 'graininess' out of a Luxor picture. The best 'answer' I got was from a Mr. Johansen at Luxor North America; he told me that 'the new units will have this problem corrected.' Would Luxor take back the units I have in stock that have this problem? No.

What I want from Robert Cooper is for CSD to publish the manufacturer warranty policies, and, all of the locations where you can get warranty repair from each manufacturer. List who repairs what equipment. At the same time, it would be very helpful if the dealer could separate the 'drop-shipment' distributors from those who really stock equipment. I would naturally rather deal with someone who stocks.

Finally, which manufacturers offer full service manuals with schematics? Surely, by now, there are no 'secrets' for the OEMs to hide; virtually every receiver out there has been cross-bred six times or more! I'm sure CSD has all of this information in the files; so why don't you publish it? Give the dealers a chance to survive!

Jerry Brandt La Grange Satellite Television Systems 200 North Main Street La Grange, Mo. 63448

Whew! For his next 'act' Brandt will single-handedly take on the actuator manufacturers of America (all 57 of them). Brandt's listing of firms he is not happy with does not totally coincide with the firms that rate-high with the national survey of dealers (see page 8 of this issue), suggesting that here, as always, individual dealers have their own gripes and problems and it takes a few hundred 'inputs' to get a true 'picture' of the national scene.

IRON Roof Antenna?

I have purchased the "Coop's Basic Manual On Fine Tuning Private TVROs" and the "Coop's Satellite Operations Manual" (both from STTI, P.O. Box G, Arcadia, Oklahoma 73007) while I attended the STTI trade show in Minneapolis in the summer of 1983. I am residing in Georgetown, Guyana, South America and I am less than 1,300 feet from the shore of the Atlantic Ocean. I live on the top floor of a two story building and the building has a flat, galvanized, iron roof. We do not have television service in Georgetown, yet, and I rely upon my VCR for access to television programming. My site coordinates are 7.45 north and 58.4 west. My question is, can I use my flat, metal roof as a reflector for satellite TV reception? If the answer is yes, how many LNAs, and at what focal lengths must the LNAs be placed above the roof? Also, what receivers and downconverters would be recommended?

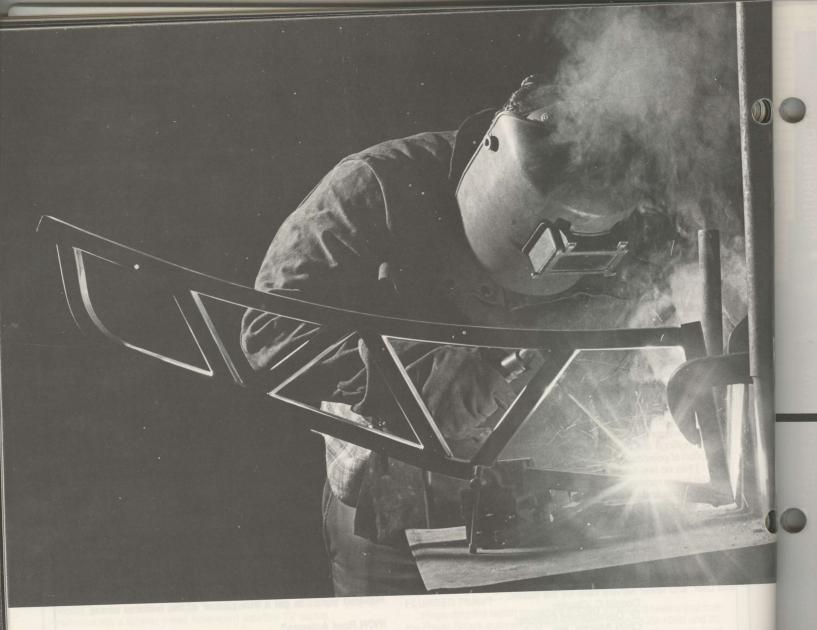
Samuel B. Lee 218 Camp & Lamaha Streets Georgetown, Guyana South America

Flat metal roofs are out. Period. If you could eliminate what we suspect are corrugated surfaces, indent the roof an appropriate amount to form a dish in the center, and rotate the house so the 'dish' pointed at the Clarke Orbit belt, you might have a chance. But not much of a chance. Perhaps a reader who specializes in off-shore installations can help Mr. Lee get started. There are terminals in Guyana now as readers of CSD will recall.

GROUNDING?

We are avid readers of CSD and CSD/2 and find them invaluable towards improving our dealer capabilities and related service. Howev-

CORRESPONDENCE/ continues on page 70



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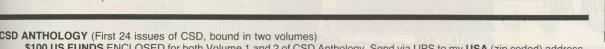
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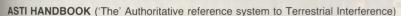
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- \$60 in US FUNDS enclosed for 12 issues of CSD (1st of month) ONLY; I reside in Canada or Mexico (not available in
- \$75 in US FUNDS enclosed for 12 issues of CSD (1st of month) ONLY; I reside outside of Canada, Mexico and USA (not available in USA).



- \$100 US FUNDS ENCLOSED for both Volume 1 and 2 of CSD Anthology. Send via UPS to my USA (zip coded) address (Note: Must be street address; UPS does not deliver to post office boxes!).
- \$125 US FUNDS ENCLOSED for both Volume 1 and 2 of CSD Anthology. Send via International AIRmail to my non-USA address.



- \$125 US FUNDS ENCLOSED for my personal copy of the ASTI Handbook/Study Course on eliminating TI (Terrestrial Interference) by Glyn Bostick. I understand Coop recommends it!
- SURE I TRUST Coop's recommendation but \$125 is a bunch of change for a book/study system. Send me something that explains it in detail, with no obligation to me.

COMPLETE so we can fill your order promptly! MY NAME COMPANY (if applicable) _ ADDRESS_ TOWN/CITY _ _ STATE __



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CORRESPONDENCE/ continued from page 65

er, I have seen little written on on a comprehensive procedure for grounding TVRO systems. If you could direct me to a good source I would be most appreciative. Perhaps it would be a good topic for a future article?

Frank J. Hildebrand, P.E. Skywalker Satellite Systems, Inc. P.O. Box 282/818 Broad Street Durham, NC 27701

You got it! We'll work one up for an early issue. Now that you mention it, several years have passed since we last 'visited' the grounding 'loop.'

MIS-Quote?

I thought you might be interested in the enclosed newspaper article that quotes Coop. It is quite apparent to me that a square antenna fed with a round-style feed (such as Chaparral) is inefficient.

- 1) If the focal length is designed for the 8 foot 'diameter' or dimension, then the 'corners' of the square dish are 'wasted' because anything outside of the 8 foot circle is not 'seen' by the feed. So, therefore, you end up with the gain and beamwidth of an 8 foot antenna, and all of that surface near the corners is simply not used.
- 2) If the focal length is designed for the 11.3 foot dimension (corner edge to corner edge), the scalar type feed will be looking at the 'ground' (or whatever) behind the reflector surface and this will raise the noise temperature of the system.

It might be interesting to see the gain and antenna beamwidth of such a square/rectangular reflector surface done on an antenna test range, **but** the noise temperature would be dependent upon the surroundings wherever it is installed.

Herbert F. Queen Herby's Electronics P.O. Box 176 Grainfield, Kansas 67737



You've got it. Properly feeding a non-round-reflector has always been a design problem. If, as you say, the scalar feed is adjusted for a focal length that corresponds to the f/D of the completely round portion of the surface, you end up using around 80% or so of the surface. It's like using a cookie cutter on a square or rectangular piece of dough when the cutter has a round shape. Some of the dough is left behind, wasted, and the same thing happens with the antenna feed; signal that falls outside of the round circle is not used, or given the real world of feeds, is under-utilized. So you re-design and place the feed out where it should be for a reflector that is the diameter of the corner-edge to corner-edge of the non-round reflector. Now you have some of the feed looking around the edges or past the dish to the ground below. And that gets you noise. Do you use a rectangular feed? Perhaps. But there is no good answer. In practice, most such reflector-feed combinations are adjusted so that the feed moves in close to the dish and under-illuminates that portion that falls outside of the circle.

The quotation came from 'The Hays Daily News' in Hays, Kansas and it concerned the Spicer/BEST 8 (9) foot dish shown in Las Vegas and written about in CSD/2 for April 15th. The newspaper reporter found our quotations interesting and since they spoke highly of the performance of the dish, the people who make the antenna were anxious to share the quotes with the folks in Kansas. Even if designer-Spicer is giving away signal with his design, it is still a very good working antenna.

TO HECK In A Handbasket?

There are two things which really gripe me with the state of the industry today; distributor advertising (complete with 800 numbers) in the consumer oriented publications (**Channel Guide, Orbit, Satellite TV Week, Satellite TV Magazine,** etc.) is obviously for the express purpose of selling directly to those consumers and thereby cutting out the regional distributor AND the local dealer. Next on my list are unscrupulous dealers who give TVRO a bad name by selling low quality equipment which they often refuse to service, and then performing sloppy installations. The same group advertises unrealistic pricing and uses shoddy selling techniques as well.

Vilis Stomers Vasto Electronics P.O. Box 730 Hilton, New York 14468

To save the honest dealers will require fast action; we need some 'ground rules' to qualify a dealer for the task at hand so that consumers can be told 'only deal with a certified dealer.' 1,000 dealers, each putting in \$50 a year, would buy adequate advertising space in TV Guide to tell everyone at once 'Look For The Certified Emblem on your TVRO dealer's truck (showroom window, business card, etc...'). If the honest, hard working dealers could be identified, and clearly marked for what they stand for, we might have a chance to drive the bad apples out of the business.

STRAIGHTEN Un

I am writing this letter of protest in hopes that it will 'inspire' the manufacturers, distributors and even dealers like ourselves to 'tighten up' our security and make it more difficult, if indeed not impossible, for 'consumers' to purchase TVRO equipment at DEALER COST!

Many times, consumers will shop around and visit 3 or 4 dealers before they make their final buying decision. Most consumers are intelligent enough to recognize the differences in dealer reputation, service, availability and price, and act accordingly. However, there seems to be a growing number of consumers who will stop at nothing (!) to get a TVRO system into their home at 'dealer cost.' It is to these individuals that I wish to draw the attention of the industry. If we do not head off this threat, the dealer network (the real backbone of the industry) will be in serious jeopardy. If the backbone network of small dealers is lost, people who spend seven days a week and 12 hours a day operating a retail outlet and making demonstrations, the industry itself is lost.

It is the dealer who makes the bulk sales possible; spending tons on advertising, providing a shop with competent technicians to service and properly install the equipment, constantly staying in touch with the factory via LONG DISTANCE, and otherwise keeping up to date so.

Satellite Total Control Cable

TYPE - 1

2 CONDUCTORS #14 GA. 3 CONDUCTORS #22 SHIELDED W/DRAIN WIRE

3 CONDUCTORS #20 SHIELDED W/DRAIN WIRE

3 CONDUCTORS #18 SHIELDED

1 RG-59/U—20 GA.—60% BRAID—100% FOIL

WITH TYPE 3 BLACK POLYETHYLENE

JACKET FOR DIRECT BURIAL



2 CONDUCTORS #14 GA. 3 CONDUCTORS #22 SHIELDED W/DRAIN

3 CONDUCTORS #22 SHIELDED W/DH

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\$ 65/M' \$210/M' \$ 89/M' \$ 65/M' \$ 49/M' \$105/M' \$210/M' \$240/M' \$550/M' \$1300/M'	## ACOND #20 ## ACOND #20	\$ 65/M' \$ 79/M' \$ 75/M' \$105/M' \$ 80/M' \$ 49/M' \$ 39/M' \$ 40/M' \$ 79/M' \$ 49/M'
	6 COND. #20 6 COND. #18 8 COND. (2-18/6-22)	\$ 69/M' \$135/M' \$129/M'
	\$210/M' \$ 89/M' \$ 65/M' \$ 49/M' \$105/M' \$210/M' \$240/M' \$550/M'	\$ 65/M' 2 COND. #20 SHIELDED \$210/M' 2 COND. #18 SHIELDED \$ 89/M' 3 COND. #22 SHIELDED \$ 65/M' 3 COND. #18 SHIELDED \$ 49/M' 2 COND. #16 \$105/M' 2 COND. #18 \$210/M' 2 COND. #20 \$240/M' 3 COND. #22 \$550/M' 3 COND. #18 \$1300/M' 4 COND. #22 \$600/M' 4 COND. #20 6 COND. #18

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\$ 9.50	\$ 8.85	\$ 8.50	\$ 7.95
\$ 9.85	\$ 9.35	\$ 8.85	\$ 8.35
\$10.50	\$ 9.95	\$ 9.50	\$ 9.00
\$11.75	\$11.50	\$11.00	\$10.75
	\$ 9.25 \$ 9.50 \$ 9.85 \$10.50	\$ 9.25 \$ 8.75 \$ 9.50 \$ 8.85 \$ 9.85 \$ 9.35 \$10.50 \$ 9.95	\$ 9.25 \$ 8.75 \$ 8.25 \$ 9.50 \$ 8.85 \$ 8.50 \$ 9.85 \$ 9.35 \$ 8.85 \$10.50 \$ 9.95 \$ 9.50

- ALL LENGTHS AVAILABLE -

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that the buying public is protected, and serviced, as they need to be.

I have witnessed **consumers** telling **distributors** that they ARE dealers, in order to buy TVRO equipment at 'dealer cost.' Strange; **after** they somehow get the equipment installed, they never seem to go into business for themselves! This is bad enough, but it gets worse. Now we have the OEMs and many distributors (but in fairness, not all) who are taking large scale advertisements in the major program guide publications actually encouraging people to 'buy direct' and 'save money' by being a 'self-installer' of their own TVRO system. Now we have mass distribution of TVRO hardware, direct to the consumers, at 'dealer-level-pricing.' Do these merchandisers ask for a tax re-sale number? **No.** Do they ask to see proof of a business license? **No.** Do they even ask to see a business letterhead? **No again!** And here I thought prostitution was illegal!

We have been on the sales floor selling TV sets for 14 years and I KNOW this is a 'dog-eat-dog' business. It has not changed (for the better, anyhow) in those 14 years and it probably never will. However, this is not an adequate reason to 'give something away' when you have the opportunity to make a fair and decent profit. Ask any prostitute; they'll tell you the same thing. There is no logical reason I can see for distributors and manufacturers to continue to confuse the two basic words of any viable distribution system; 'wholesale,' and 'retail.' And there is also no good reason for the TVRO industry to allow this

practice to continue!

I would like to see any (and all) TVRO trade association devote no less than 75% of their annual budget to the job of providing the dealers with proper 'protection.' If this takes a law through Congress, so be it. If it takes a dealer-trade-union, so be it. But we need, as dealers, to make it VERY UNATTRACTIVE for distributors and OEMs to continue their present practices of selling 'wholesale' to every Tom, Dick, Harry or Marilyn that pops in the door or out of their telephone.

I believe 100% in fair competition but I, for one, would NOT like to see the TVRO business end up 'on the shelf' like the old CB radio business did. Does anybody out there in TVROland have any sugges-

tions?

Bob and Judy Showers Carlisle Radio & TV Co., Inc. 1322 Spring Road Carlisle, Pa. 17013

Readers might note the advertisements appearing on pages 25 and 27 in the June issue of ORBIT Magazine. On page 25 we see the headline "Satellite TV Direct"; a firm that offers an 800 number to sell readers TVRO hardware. The firm calls itself 'DBS Corp.' and if that is not misleading enough, they also offer a 'Satellite TV Buyer's Guide.' Who uses a buying guide? The consumer; that's who. Now notice that they accept VISA/Mastercard and American Express cards. How many dealers charge their purchases on their charge cards? Not very many! Who does? Consumers, of course.

Now turn to page 27. It headlines "Bob Clifford Just Installed His Own System!". The sub-heads start off with "He also . . . saved substantially by purchasing direct . . . found our kits designed for owner installation easy to install . . . found complete and courteous technical help as close as our toll free number." The name of the

firm? 'Consumer Microwave Electronics Corporation.

Now, what's wrong with this? Nothing. This is a free market and if somebody wants to cut out the dealer and sell direct, that's his business. If the consumer wants to send his broken receiver back to Los Angeles or Springfield, from Scranton, when it breaks, that's the consumer's problem.

But . . . as a dealer, you don't have to help these guys survive.

And that is exactly what you do everytime you introduce a TVRO client to Orbit Magazine! If you want to stop this activity, stop giving them gasoline for their vehicles; cut your clients off from Orbit Magazine as long as Orbit is going to accept this type of adver-

tising!

There is one more thing you can do; refuse to handle any brand names which these firms sell. Don't put yourself in the awkward spot of having to explain why you sell a Luxor for \$900 and they can buy it for \$700 from one of these direct outfits. ONLY HAND-LE equipment which is not sold by these direct-discount folks. If you tell your distributors, and your OEMs this is how you feel, they

will shortly get the message. If we can take away the equipment sources for these direct-selling guys, and, cut off the free promotional rides they are getting through hand-out copies of Orbit (or anything that Orbit is involved with), we can cut our losses in this battle to manageable levels. Writing CSD letters won't win this battle. You need to take a few decisive steps on your own. Stand up and be counted, or lay down and let them roll over you. That's the choice.

MORE/ Straighten Up

Publications such as STV Magazine, Orbit and others that are available on the newsstand, or widely distributed, are filled with advertisements from distributors (DBS, Satellite Sales, Inc., etc.) and these firms will send price lists to anyone and everyone who is bright enough to dial their toll-free numbers. A potential customer of mine, who works at the local General Motors/Delco plant, confronted me in his home with several price lists which he had called toll free numbers to obtain. He wanted to know if I would sell the proposed system equipment to him (I had prepared a formal quote) 'cheaper than the distributor's wholesale price'!. He freely admitted how he got the price lists. Then he took these lists to work, walked into the GM 'copy room' and made up who-knows how many copies and distributed them to all of his co-workers!

Satellite TV Magazine (STV) recently published an article (March 1984) called 'A Satellite System For All Seasons.' The piece was informative, written by a well known person in the industry, explained each part in a typical TVRO, leading up to three recommended systems (by brand names). The conclusion listed a 'Basic,' a 'Civilized' and a 'Top Of The Line' set of equipment. At the bottom of each set, however, is a price. Using an example from the 'Civilized' category, a consumer who picked up this magazine on the newsstand now believes he can get a Paraclipse 12 foot antenna, an MTI2800 actuator, Drake ESR24 receiver, 100°K Avantek LNA, polarization rotation system and I assume wiring and installation for the magazine cited price of \$1500 to \$2200. I sincerely hope the author of this piece does not ever attempt to make a living installing this type of equipment package in this price range!

There must be retail price stability if dealers are ever going to stock equipment. At the STTI show in Las Vegas back in March of 1983, a bunch of angry dealers dumped their frustrations about the broadcasting of wholesale pricing on the short-lived **Sat-Scene** video magazine from Satellite TV Specialists. Out of that ranting and raving came changes, and NASDA, which went nowhere (it was not then and it would never be a true dealer organization). The situation has not improved since then and an outraged dealer who calls to complain about this type of activity will get nothing but a polite yawn on the other

end of the line.

There is no such thing as 'retail pricing' in this industry; only total chaos at the dealer level. The people who are feeding this situation should be identified and appropriately dealt with.

David E. Thom
Dave's Antenna
5360 Holly-Byron Road
Holly, N.Y. 14470

You just identified them. Now let's figure out how to 'deal with' them. STV Magazine (yawn). Is this a consumer magazine? It is sold on the newsstand and it has articles for consumers. It must be for consumers. Are the people who put it together in the consumer field? Is that 'well known person' who wrote the March '84 piece in 'our industry,' or, is he a consumer advocate? If he tells readers wholesale prices and mis-leads them into thinking they can buy the system you describe for \$1500, he must be some sort of consumer guy. He certainly is not one of us! A more violent person might suggest that the next time you see this person 'infiltrating' one of our trade shows, that you walk up and punch him in the nose hissing 'spy' as you let loose a right hook. We suggest you curtail that urge and do the more humane thing; anyone who writes for STV Magazine, who purports to be from our industry, should simply be ignored. Don't patronize ANYTHING he is involved with and make it well known that you will not support any publication or event which he currently does work for. You can't support someone who is setting out to bury you and put you out

THE EXTRA EDGE



Up until now, the TVRO dealer hasn't had much choice when it comes to the brand of LNA he uses. Now there's one more choice. Winegard!

Winegard's LNA is designed to provide superior performance. The kind of performance that gives you that critical extra edge in satellite reception with the reliability you expect from Winegard.

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of business. It is just that simple. Naturally that should extend to the STV Magazine 'program guide' as well (ON TV). Don't promote it, don't support it, forget it exists. If they are not 'fer us,' they are 'agin us.'

Now look inside STV Magazine. If they are a consumer magazine, and they insist of telling consumers how they (the consumers) can put you (the dealer) out of business, check to see if anybody you presently buy hardware product from is advertising inside. They are? Good. Now get on the horn or get out a piece of paper and notify those firms that if they continue to support a magazine that insists on mis-leading consumers by telling them

how they can 'go around' you, their stocking and supporting dealer, you will no longer buy their product.

Let STV Magazine, since it insists it is a consumer magazine, and insists on distributing on the newsstand, make a living by selling consumer oriented advertising. Let them sell ads to DBS Corp. and Consumer Microwave Electronics Corporation and that ilk. Or let them carry brand-promoting generic ads that don't give away' wholesale price lists and wholesale pricing to your prospective retail customers.

You dealers are in a battle for your financial survival. Identify who the enemy really is here and quit supporting them. Get mad. You don't have to take this crap anymore!

COOP/ continued from page 5

tions." Now I knew why Club Med and Holiday Inn had not opened up on Johnston!

Dehnert took off with the Colonel for a quick tour of the island, so I couldn't give him a piece of my mind like I wanted to do. I rode over to inspect the dish with **Paul Bryant**, an electronics engineer assigned with the responsibility of keeping the island's complex communications system operating. After we got oriented and had dropped our bags off at building 297 (VIP quarters with 3 bedrooms, a stocked kitchen and bar, color TV and everything any discriminating 'VIP' could ask for) we headed as a group to the dish. Here was the basic problem:

1) The dish was anchored on F3R and it was providing a single channel of television through a COM66T receiver fed by a Dexcel 120 degree LNA. Using the six Hawaii spot beam transponders on the horizontal side (2, 6, 10, 14, 18 and 22) they were going into a Jerrold modulator on VHF channel 4. The modulator fed a Jerrold high output (4 volt) CATV/MATV amplifier which in turn was connected to a channel 4 five



element yagi antenna.

 The yagi squirted out around 1/20th of a watt and people living in quarters up to a mile away were actually watching this with not-that-objectionable signals.

3) However, many of the living quarters, plus the private 'clubs,' were spread out further than that. Plus, the 1/20th of a watt was not strong enough to get inside of the buildings and unless the viewer had an outdoor antenna, he was not getting a picture.

Our task was to provide not one but two channels of television, strong enough that a viewer with rabbit ears could get a high quality picture, anyplace on the island. We broke that down into three steps:

1) Verify the performance of the antenna. The 30 foot dish could, if well 'tuned,' be expected to produce perhaps 50 dB of gain. We decided it might really be close to 48 dB at best. The 120 degree LNA was replaced with a California Amplifier 75 degree unit, and the feed, which had been designed originally for dual-pole operation, got a 70 degree USS/Maspro LNC on the opposite side.

Working from a 'high ranger' system that was capable of lifting men and equipment 90 feet into the air, Dehnert and Irv Wolfe (who is in charge of the radio communications systems on Johnston)took the feed apart, cleaned up the connections, and modified the feed plate mount so we could do a complete focus adjustment on the feed itself. Working through Saturday evening we managed to squeeze another 1.5 dB out of the system as it sat on F3R.

"Boy, you guys are good!" said the island's Recreation Director as we reported to the 'mess hall' for dinner. The compliment was repeated several more times as we sampled some of the best cuisine I have had anyplace in the world. The guys on Johnston really eat well, with fresh fruits, vegetables, meat and bakery products flown in several times per week from 'Hono.' We tried to explain that we hadn't done anything yet; we were merely fine tweeking what they had previously installed themselves. "Best picture I ever saw!" exclaimed another. We suggested he wait until Monday (our third and final day) before he got too excited.

While we were clearly local heroes at the end of day-one, the 'fun



INSIDE THAT BUNKER/ well, it's classified. Use your imagination.

part' was still ahead. When we headed for Johnston from the states we had a 'master plan' of attack. First we would get the existing system operating the best it could; then we would get the new VHF transmitting system installed and operating; finally, we would try to move the big dish (which was never designed to be moved!) over to Galaxy One.

2) Improve the local coverage. The Jerrold 4 volt line amplifier was connected to a yagi transmitting antenna. We had brought with us the makings for a three channel transmit system plus a new professional quality transmitting antenna. We would interface the basic satellite receivers with VHF channel modulators, amplify the modulator's low output signals in a multiple-stage power amplifier, and radiate the resulting signals. When we were finished with installing this portion of the system, I was elected to take a CATV field strength meter and go over the full island to verify that we were saturating the island on both of the actual operational channels.

There is a firm in California called NSD, Inc. They design and manufacture solid-state VHF and UHF power amplifiers for transmission systems. I became familiar with them about a year ago, and had steered Dehnert onto them last fall. It had been my suggestion that we take three of the PC Electronics 10 watt transmitters, modulate them on channels 2, 4 and 6 with satellite video and audio, and then connect each of the three transmitters to separate, omni-directional coverage transmitting antennas. Dehnert had a 'better idea'; go from the satellite receivers to the three separate VHF modulators (channels 2, 4 and 6) and then feed the three modulator outputs into a newly designed NSD broadbanded power amplifier. Dehnert won out with logic, and besides his approach was better in this case.

3) Finally, get some decent input signals. F3R's Hawaii spot beam is at best in the 24/25 dBw region on Johnston. On the 30 foot (estimated 48 dB gain) dish, we found CNN on 14 around 1 dB below threshold (best channel) and WTBS around 3 dB

below threshold (worst channel)

Prior to our arrival they had been locked up on the horizontal side of F3R, after a brief romance with W5, and WTBS ran a fair amount of the time. Based upon our observations in 'Hono' we certainly wanted to take a look at Galaxy. It was running (best case) 3 dB or more above the best of the F3R levels there; would it make it to Johnston?

We were prepared to leave two fulltime channels operational (4 and 6), and to make the system instant-expandable for a 3rd channel

(2) when they were ready.

Day two was Sunday. Just before quitting time on Saturday I had replaced the Jerrold 4 volt amplifier and the five element yagi with the NSD ten-watt-per-channel amplifier and the 'broadbanded' omnidirectional crossed-dipole array Dehnert had arranged for. This was a 'what the hell . . . let's turn it on and let it cook' decision and we were not equipped at that point to really test the NSD system. As we left the building, I detected the faint odor of frying electronic parts.

Using the TV set at our quarters as a check point, it was obvious to me that we did not have more RF signal level than we started with. This was disconcerting since we should have gone from 1/20th of a



BEHIND THAT BARBED WIRE/ that's classified also.



THEY BUILT the counter balancing system and mount on Johnston in their excellent shops. Those guys could do anything there and they have the tools and parts to do it in a warehouse; someplace!

watt to 10 watts! I rounded up a Bird wattmeter from the radio shop and checked the output power of the transmitter. There was none. Even on the 10 watt full-scale range position, we had nothing indicated. Time to take the NSD apart.

As we pulled it down from the rack Doug detected a 'rattle.' Sixty seconds later he had the back off and handed me a pair of 5 watt ceramic, 2 ohm resistors. They had heated up so badly that their solder joints had melted! Six hours later we would be operational

The NSD amplifier uses a TRW chip-amp to boost the input level from the modulators and it in turn drives an 'IPA' (intermediate power amplifier) stage. The IPA uses a beefy transistor which should be capable of around 1.5 to 2 watts (peak pedestal power) per channel with 3 channels through it. Then there is a final amplifier (HPA or high power amplifier) stage which should get us easily to the 10-14 watt per channel level with 3 channels operational.

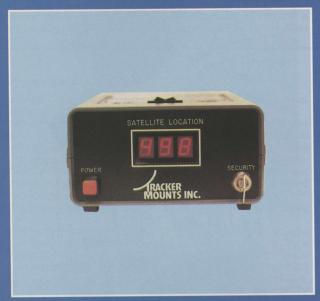
This is a 'class A' amplifier; totally linear. That's good since linear means you get a 'perfect mirror image' of the input at the output (i.e. no distortion added), only at an increased power level. To maintain 'class A' operation, the solid state transistors must be very carefully 'fed' with the appropriate voltages. Something called 'bias' is an important part of establishing the operating 'conditions' for the power amplifier tran-

In the amplifier there is a master 28 VDC power supply and two independent 'current limiting' power control circuits which also establish the (lower) bias voltage required for each stage.

Apparently, this is what had happened.

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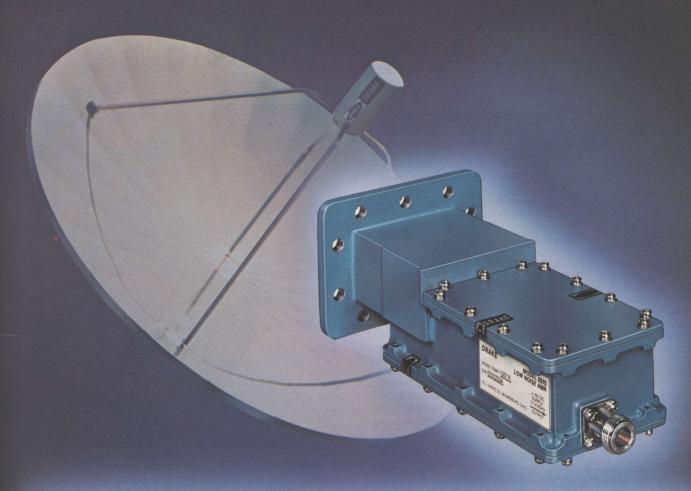
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2574	86 to 100 degree K	50 db	
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COOP/ continued from page 75

1) The NSD got to Johnston before us. Somebody figured they could install it so they hooked it up between the channel 4 modulator they had on hand and their channel 4, 5 element,

2) The channel 4 antenna was fed with a length of RG-59/U and since it was originally a home-receiving antenna, it was a 300 ohm antenna. To make it work with the 75 ohm cable, they had installed a 300 to 75 ohm 'matching transformer' at the antenna

3) The matching transformer has a finite power handling capability; perhaps 1/10th of a watt. Certainly not much more

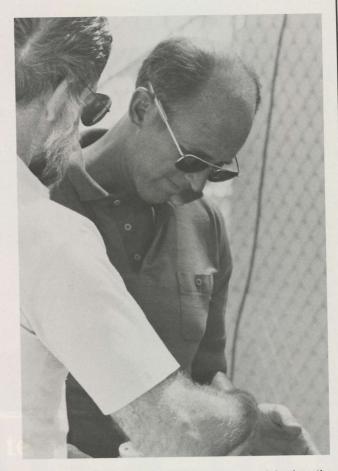
4) The matching transformer 'cratered' and when they discovered they were not getting better signals over the island they returned the system to the original 4 volt CATV amplifier.

The blown matching transformer had presented the NSD amplifier with an exceedingly poor 'match.' The high 'standing waves' caused by the poor match ended up circulating back into the output power amp stage of the NSD. This in turn caused the current in the final amplifier stage to get very high. The 'current regulator/bias' network got hot (very hot) and two of the 2 ohm resistors fell off the board since their solder connection was now gone. This created an extra 'load' on the remaining 2 and 1 ohm resistors in the current limiting/biasing network and one of the 1 ohm resistors simply 'gave up' under the pressure. This caused a small transistor on the circuit board to short and from there it was ALL down hill!

First we had to repair the power supply board. Two and one ohm, five watt resistors do not grow on trees; not Palm trees anyhow. I finally found a TV set in the radio shop that was there for repair and inside noticed a suitable replacement resistor. I spotted a note on it that said "... waiting for parts to complete repair ...". After snip-



DEHNERT (dot on right) and Irv Wolfe (dot on left) spent better part of two-days working on the feed system.



COLONEL MOORE (right) listens while Dehnert explains how the feed mount system has to be re-built in the shop to allow full in-out peaking. Thirty minutes later, late on a Saturday afternoon, the Colonel was back with the re-built piece of 1/4 inch thick steel. 'You wouldn't believe the cooperation the Hobby TV project got' from the Johnston crew.

ping out the needed resistor, that set would be waiting for another

The next problem was finding a suitable transistor to replace the blown one. The folks on Johnston have a tremendous cache of spare parts (remember they once repaired busted missile control electronics here) but it still took us an hour of cross referencing to locate a transistor with suitable characteristics (an exact replacement was not

Dehnert had been drafted to do the re-working and I helped Sam Nakamura go through hundreds of parts drawer bins looking for a suitable NPN transistor. Check out was not complicated; the master input supply voltage was 28 volts DC; the output should be in the 25 volt range. If the supply was working properly, you would find the 25 volt level at the output. If something on the board was awry, you typically got 2 to 3 volts output.

Through all of this Base Commander Colonel Moore was there most of Sunday helping us chase parts and cross reference transistors. Moore is not your average military person; in fact all of the crew on Johnston was several cuts above average. While there are 350 people there (18 are women and you can fantasize your own scenario here), there are only six Airforce people on-island. The largest contingent from the military is Army (they are charged with the responsibility of 'guarding' the chemicals stored there). The largest group is civilian; people employed by Holmes and Narver, a firm that specializes in operating remote 'bases' for the military. Colonel Moore characterizes the airforce presence as 'hosting' the rest on-island. There is every imaginable form of recreation; a superb bowling alley, movie theater,



BIKES ARE POPULAR/ the dining hall is more popular on Johnston. A fellow could put on alot of weight here; quickly.

(miniature) golf course, excellent snorkeling and scuba diving (with boats provided for each), special events virtually every night and a tennis court. They even had television ... before us. A 100 watt AFRTS transmitter has been operating on Johnston for 15 years or more. Two military guys keep it, plus a pair of FM radio transmitters, operating and the TV part depends upon 3/4" and 1/2" tapes sent out from AFRTS in Los Angeles. Locally, we talked about 'AFRTS TV' and 'Live TV.' Live of course was the satellite feed.

The satellite project began several years ago. Colonel Moore characterizes it as 'hobby TV' since it has no official sanction or funding from the military. Funds to buy the equipment have come out of a 'recreational fund' which gets substantial support from the civilian contracting company, Holmes and Narver. Aware that I publish CSD,

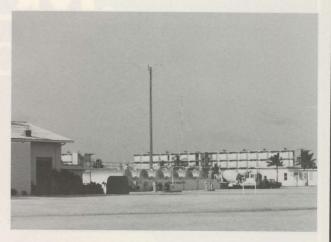
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JOHNSTON BUILDINGS often rise 3 stories. Everything is bunkered here and the center background shows the thin outline of the 640 foot Loran-C transmitting antenna.

Moore urged me, "Please be sure that you explain that the U.S. Airforce (and Army) cannot be construed as 'endorsing' your equipment!".

Nobody was endorsing the NSD amplifier by 2 PM Sunday afternoon. That it had quit 'apparently' because it was operated without an adequate 'load' was accepted. That it had not been designed for that unfortunate mistake so it would survive was frustrating at best. On the way to Johnston Dehnert and I had stopped to visit with Tom Litty of NSD and to tour their facility. He had warned us about operating it without a load, but since it preceded us to Johnston, the damage had been done even as we visited with Litty.

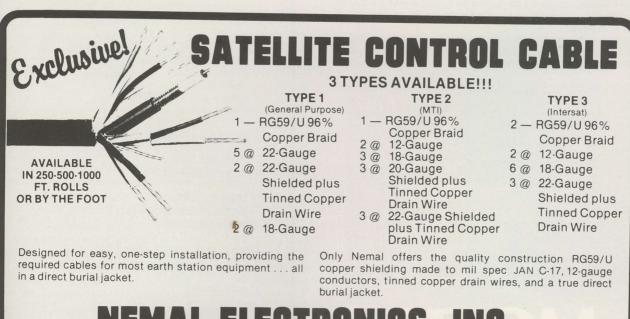
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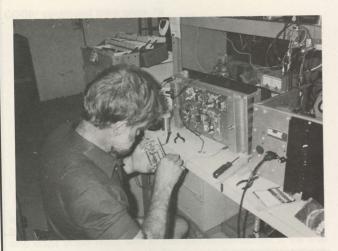
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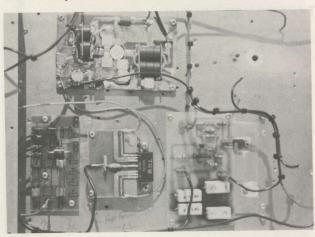


UP TO HIS NECK in faulty power supply parts, Dehnert spent a good part of his Sunday rebuilding NSD electronics. The Chaplain told us they said a prayer for Doug and I in the Sunday morning service; the NSD amplifier needed it more than we did!

age. The final power amplifier simply was not working. Nuts.

I had a suggestion. Since the intermediate power amplifier was working, why not remove the HPA from the unit and re-wire the output of the IPA directly to the output bandpass filter? That would get us a couple of watts per channel to drive the omni-directional antenna; considerably better than the under 1/20th of a watt which the Jerrold 4 volt amplifier provided, and we would be on two channels rather than one. Ten minutes later we were back operational, with a Bird wattmeter in the line, with close to 6 watts output from a single channel. Reports immediately started coming in that they had never had such a strong TV signal before. Going for broke we fired up the second channel, reduced the drive from the first (by turning down the modulator output level) and settled on about 3.5 watts per channel as read on the Bird wattmeter.

By now we had shot most of Sunday and were facing missing the chow hall if we didn't beat it over there quickly. The final step would await Monday; our third and final day.



MISSING BOARD/ upper right (hole in chassis for heat sink) housed the HPA stage for the broadbanded amplifier. It shorted inspite of being 'unconditionally guaranteed' to withstand virtually any antenna mis-match.

We spent the evening at the Colonel's residence, located on a nifty point that sticks out into the man dredged lagoon. Most of the fill material used to expand the island from its original 65 acres to the present 650 acres has come out of the lagoon. A deep water channel, and turn around, capable of handling some very large Navy vessels,

The one the others co

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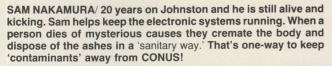
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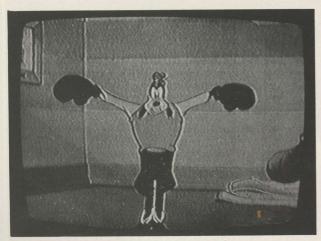






has been 'dug out' just inside of the reef that surrounds the north shore line. The Colonel's residence juts out into the lagoon and we fed every imaginable type of fish including a huge eel from his back patio. We noticed his TV reception was sub-standard when we arrived and sixty seconds later Dehnert was on top of his roof inspecting the TV antenna. Somebody had installed Jerrold TV antennas on virtually all of the living quarters, and many of these antennas had two and four way splitters on them. **Unfortunately**, they were installed as '300 ohm/flat wire' systems and the heavy salt-laden-humidity had taken a toll. Dehnert found the Colonel's 300 ohm line had simply rotted off of the antenna so he did a quick, temporary fix, and we suggested that they redo all of the (MATV) antennas on the island with 75 ohm coaxial line and proper coax line splitters. Irv Wolfe and his gang will be busy for months cleaning up the local systems if they follow through on our recommendations.

Monday was antenna moving day. From F3R to Galaxy 1 is not very far; from Johnston (where the satellites are all to the EAST) we had to go west just over 2 degrees and up just over 3 degrees. A group of Army guys 'volunteered' (they really did since it was for their benefit that the antenna was to be moved) and in short order Dehnert had them trained in the fine art of moving turnbuckles. Using a Fluke meter and RF head (see CSD for May 1984) connected to the 70 MHz test point on the USS/Maspro downconverter, in no time at all the 'Army' was maximizing the antenna.



DISNEY (TR4) ON JOHNSTON has slight noise (AVCOM receiver, Cal Amp 75 degree LNA) on 30, foot dish. But not much.

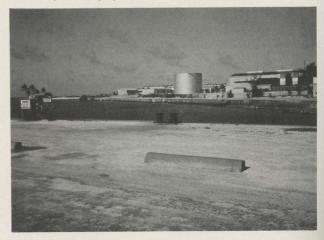


HEAVE-HO!/ When you need to move a 30 foot dish on Johnston, you put out a call for Army volunteers. We had several more than we needed.

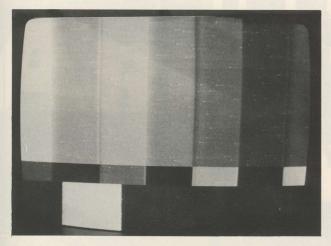
We instantly knew we were far better off on G1 than F3R. The best **relative reading** we saw on the Fluke from F3R was between 12 and 13 (mV). In short order we were in the 16-18 mV region with the hotter side (odd numbered, horizontal polarized) signals. Even the less powerful (even numbered vertical set) were in the 14 mV region.

By 3 PM or so we were done. While I rode the full island circuit with Garrison Brown of the island security force, stopping to measure the off-air signal levels with a CATV type field strength meter to see just what our 3 watts or so per carrier was doing, Dehnert cleaned up the wiring in the rack. Pronouncing the island 'fit' upon my return we were heading for some R and R when Sam Nakamura yelled to come back and look at the picture on channel 6. We did and it had a severe problem. It took just a minute to determine that we were witnessing an LNA system failure. This was the Cal Amp 75 degree unit, feeding the AVCOM 66T receiver. We did have the Dexcel 120 as a replacement but since we had this system on the weaker side of Galaxy (i.e. the even numbered transponders) we could ill afford to bump ourselves back up 45 degrees in noise temp; if we could help it.

So back up into the high ranger went Dehnert for another fun-hour of balancing out there in space in front of the feed. The problem, it would turn out, was not the LNA itself, but the type N fitting on the cable that ran from the output down to the lower-mounted down-converter. It seems that cable had been installed back when the dish originally went in, and some moisture had gotten inside. We had moved the cable several times while working on the feed optimization and that was all it took to make the shield or ground side intermittent. There was just enough ground for 'some' DC to flow to the LNA, but



SEVEN FEET ABOVE SEA-LEVEL/ all over. Talk about flat!



G1 TR1 signal looked pretty decent on Johnston as well. Considering that the 'next time zone west' is 'tomorrow,' this signal is a long ways from home!

not enough for a proper 4 GHz 'return line.' The signal pumped in and out, and the LNA broke into oscillation (unloaded at 4 GHz) with meter-pinning signals around TRs 10 and 22. By the time we got it repaired we had less than 5 minutes to get to the mess hall. So much for R and R.

Since this was our last night on Johnston, there were several things Doug and I wanted to do. First there was the inevitable 'T shirt' shopping. Next we wanted to visit the AFRTS facility to see what they have to work with. Since they are still in a 'tape loop,' we wanted to discuss their getting a dish to 'take' the AFRTS feed off of FIR. It turns out that if they went through normal AFRTS channels it would cost Uncle Sam around \$500,000 or so to put in a suitable (to them)



BETTER YOU THAN ME, IRV! Head of electronics on Johnston, Irv Wolfe has been there 15 years. It's home. That's close enough,

TVRO. We told them for \$20,000 or less they could have 48-50 dB SNR signals from AFRTS. We found out there are more than 300 'AFRTS affiliates' still in the 'tape-only-loop' and a quick calculation would reveal that if each of these had to go for a \$500,000 militaryspec terminal system, Uncle Sam would lay out more than \$150,000,000 to complete the satellite-equipping of the tape-only AFRTS affiliates. Obviously somebody at the AFRTS headquarters needs to investigate what is happening here. It does not take very long to chew up \$20,000 when you are sending or bicycling 3/4" tapes to more than 300 affiliates all over the world. As long as they insist on writing system specs so that only Harris or S/A could fill them, they will continue to be forced to budget \$500,000 per terminal. And you can



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just picture some guy at AFRTS headquarters shaking his head "Hell no, they can't have a \$500,000 satellite terminal on Johnston (etc.)" as long as he has to make his budgets work. On the other hand, if he could save \$15,000 a year in tape costs to Johnston by authorizing a \$20,000 terminal, suddenly the whole project becomes feasible. You can be sure we are working on opening a few eyes in this area.

After the AFRTS tour we wandered into the island power station. They have seven huge diesel generators each capable of putting out 1,400 kW. The same system runs their salt water desalinization system (150,000 gallons per day on the primary system plus an equivalent back up system). I was extremely impressed since the present population only averages around 800 kW power use in peak times. Talk about 'spare' or 'growth' capacity!

"You guys really did a great job; here, let me buy you another drink!" We were at the last stop for the night; the Tiki Club which was originally installed for the officers back when they had over 3,000 people here. The guy that was so happy was in the management team for the civilian contractor Holmes and Narver. "But this is going to change life out here, just like bringing women here did." He explained that when the Equal Employment Opportunity (EEO) Act was adopted, his firm had to accept job applicants from the disstaff side as well. The first women on Johnston had created quite a stir.



LOSING SEVEN magazine working days in May because of the Johnston trip, I had to resort to typing-while-flying to get CSD and CSD/2 done on time. On the return trip to Minnesota in the USS Mitsubishi MU-2 Turbo Prop I promptly set up shop and cranked out a quick 15,000 words.



LT. COLONEL PAT MOORE/ center, flanked by aides Manchester (left) and Venneman (right) with the Johnston Island 'Hobby Satellite Antenna.' They found the antenna in the military surplus sytem (Point Magoo, California) and designed and built the mount plus feed on-island.

'Plenty problems," he recalled. Was it better now? "No, now we have more women each year and more-plenty-problems. TV will do the same thing. There will be a constant battle over which satellite program service gets broadcast on which channel (4 or 6). I hope they leave it so that we have CNN or CNN2 on one of the channels all of the time."

Much to our surprise, we learned that some of the people working on Johnston had been there 15 to 20 years. While the military group is seldom there for longer than a year, the civilians employed by the contractor can re-enlist for additional 'contract periods.' There are no 'families' there; no dependents, no wives. Not even Colonel Moore could have his family on island, even for a visit. Only on 'official business' do you get to Johnston.

People such as Irv Wolfe, who heads up the radio shop and under whose wing maintenance and operation of the new 'hobby-satellite-system' now falls, is a 15 year veteran of Johnston. "I sowed my wild oats when I was young," he reflects, "and this is home to me." It takes a special breed of dedicated man to settle down on a coral man-made island less than 3 miles long where enough 'noxious stuff' is stored to wipe out most of the living souls in California.

The average person has never heard of Johnston Island. President Nixon was there briefly to welcome the first moon-walking crew after they splashed-down nearby, in July of 1969. Several thousand people will know it quite intimately by the end of 1986 or so. All of that gas stored there . . . is to be re-worked in a special 'plant/ factory' now being built. Unable to burn, bury or dump at sea the stockpiles, the U.S. Government is spending a considerable sum of money on Johnston to reprocess it into 'harmless crystals.' The

population growth, to as many as 3,000 again, will be on-island to operate the gas processing plant. And thanks to the 'Hobby Satellite TVRO' system Doug and I installed between May 19 and 21, they'll have access to the 'real time world' from the USA during their stay on Johnston. I can think of several less productive ways we could have spent that three day weekend.

KOREAN Intrigue

Condemnation of an entire nation or culture is not my 'thing' so I trust that those who find themselves within the nationality to be discussed will not take this as either personal condemnation nor a national

I have not known very many Koreans. I am not all that certain I am bright enough to recognize a Korean if he or she were in a crowd of Japanese, for example. Others in our industry have spent time in Korea, and quite a few are 'still there'; perhaps wishing they knew how to disengage without losing their shirts.

The history of Korean involvement in the TVRO business dates back to the fabled and best forgotten 'Howard TVRO Receiver'; originally scheduled to be released to the industry at the July 1980 (!) SPTS show in San Jose. Taylor Howard had contracted with some people from western Canada to design for them a receiver. Taylor missed his deadline and the receiver was not going to be ready for the San Jose show. That prompted some of the Canadians involved to locate an alternate source for the receiver. Taking designs worked out by Howard, an attempt was made to get a receiver produced first in Hong Kong, then Korea. Ultimately it would be Korea and 'The Entertainer' was born.

Many people figure 'The Entertainer' was a total product of Taylor Howard. Not so, and he wisely rejects that notion when asked. Still, those who were attempting to peddle 'The Entertainer' saw some wisdom in perpetuating the myth that it was a 'total Taylor Howard receiver' and to this day (and this line) that myth has gone on, unchallenged.

When the Korean electronics industry got their hooks into the American TVRO industry, via 'The Entertainer,' they saw something they liked. Here was a relatively simple box which looked like it was production-capable in big numbers on an assembly line. What the Koreans did not understand, then and perhaps still today, is that there is but a limited market for such boxes in North America and virtually no market for such boxes anyplace else in the world. This led to the first basic problem; too many (being) produced. Eventually as the warehouses filled, somebody with lots of bucks tied up in parts and labor saw he had a problem. And that led to the second problem; dumping of merchandise. Now we had people offering 'The Entertainer' (or some face-plate-lifted variation of same) at cut-throat pricing, just to move parts and get some cash flowing. When the various versions of 'The Entertainer' started getting dumped in big numbers, it depressed the entire TVRO marketplace for awhile. Why pay \$325 for a Sat-Tec R2 when you could buy a Korean 'Entertainer' for \$275?

Now it happens that the first lot (1,000 or 2,000; depending upon whom you ask) of 'The Entertainer' did not work so well. Poorly if at all would be a more apt description. The Koreans were operating at a handicap. Two actually:

- 1) They did not have adequate test equipment to simulate a bird-filled-with C band downlink signals, and,
- 2) They did not have a C band bird they could 'tap' for alignment purposes.

So the receivers arrived in North America essentially 'uncheckedout.' and that started a domino effect. First the importer tried out the receivers, and he found out that most did not work; either at all, or well enough to ship. He had a warehouse filled with boxes, each containing a non-working TVRO receiver. He contacted Korea to get the production stopped. The Koreans saw the notice and panicked. They had a 'Letter of Credit' for 2,000 total units and they had dispatched 1,000 already. Those 1,000 were the ones that did not work. They quickly figured out that if the first 1,000 did not work, the next 1,000 they were then building were not going to work either.

I suspect the honest thing to do at this point would have been to immediately cease production and find out what was wrong. That's not what they did. Instead, they ignored the communication from the importer and sped up production. If they could get the second 1,000 out the door quickly enough, they could collect on the balance of the

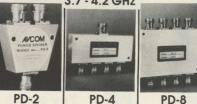
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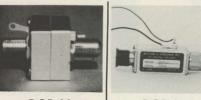
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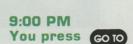
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InterCeptor II Functions:

Takes control of sync, mutes audio and requests "SAT?" over video on your TV.

You press W 4





InterCeptor II Functions:

Looks up satellite position in memory, decides which direction to go to the satellite and the correct direction to arrive from. Requests "TR?" over video on your TV.

You press 1





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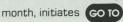
Checks parental lockout memory for this satellite and transponder; adjusts polarity, synthesizes transponder 11 frequency, displays actuator position and signal strength over video on your TV, tells actuator to go 200 counts past satellite and return to exact position for W4, turns off A and B audio and expansion, turns on filter and DNR, turns on video B aux. input, external descrambler and stereo audio aux. inputs, displays video B on your TV screen, checks sync and regenerates, unmutes audio, releases control and awaits your pleasure.

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You are asleep.

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Remembers timed program you entered last









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awaits your pleasure.

8:00 PM

You press button

InterCeptor II Functions:

Checks parental lockout memory for this satellite and transponder and decides it

does not need the combination; takes

control of sync, mutes audio, adjusts polarity; synthesizes transponder 4

filter, turns off DNR, unmutes audio,

regenerates sync, releases control and

frequency, displays "TR4" over video on your TV, synthesizes audio A frequency at

5.80 MHz, synthesizes audio B frequency

at 6.80 MHz, switches from narrow to wide deviation, turns on expansion, turns off

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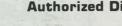
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letter of credit. In effect, let the buyer figure out what he was going to do with 2,000 broken TVRO receivers rather than with 1,000 broken

Ultimately all 2,000 would end up in some distributor's warehouse or on some dealer's shelf. Not alot of them would end up in some customer's home; not for very long, anyhow.

The saga of 'The Entertainer' buried the Canadian consortium that put up the bucks to purchase a design from Taylor Howard. Bankruptcy followed and they washed their hands of the whole deal. But there were still thousands of receivers around. A few hundred got re-worked by some clever Canadian and American chaps and today there are in fact some very good working 'Entertainer' receivers out there. But for everyone that is working, somebody took a dollar bath on another one and it is gathering dust on a shelf someplace.

All of this involves the 'first' entry into the marketplace of Korean 'entrepreneurs.' And this began way-way back in 1980! So, you see, the 'Asian Invasion' of our industry is not a recent event at all. You don't go back much further than 1980 and find even American product in our field

Now let's jump to the present time. We have quite a number of American firms heading for the Far East and not a few end up in Korea. The Koreans are very good at romancing an American manufacturer; both here at home and after he (or she) lands in Korea. I have talked at length with John Ramsey of Sat-Tec and Mark Anderson of Anderson Scientific (to name but two) who have been through 'the course' in recent months. Both tell virtually identical stories although neither was even aware the other was involved in 'Korean intrigue.

Let's use Anderson Scientific as our present-day example since they are sort of the point of all of this anyhow. Mark Anderson and his Dad, Keith, thought they had pushed their own South Dakota production capabilities for their Keith Anderson designed 'block down conversion' receiver as far as they could, about the first of this year. Using every resource they could muster, they were topping out at around 2,000 receivers per month and the marketplace was demanding more; maybe twice that number. They needed a quick solution for a short-term problem.

This is a situation which Korean electronic guys love. They waltz in and spread out binder after binder filled with attractive color photographs showing all sorts of electronics in production, and after production, in their modern facilities in Korea. They shoot you a price you think is attractive and offer to 'take you to Korea' to inspect the plant.

What the heck; four or five days spent as their guest seems like it might be fun, and you go. You might even solve your problems!

Once in Korea, the arm-twisting begins. You are 'gifted' and 'catered to' as if you were royalty. In a sense you are; American 'capitalists' are treated with the utmost respect and care there.

The Anderson's struck a deal; with an initial shipment to be 2,800 units. Anderson was to supply all of the technical expertise, and some of the component parts. Even the initial-run printed circuit boards would come from Anderson. All the Koreans had to do was stuff boards, wire up harnessing, mount the boards and check the receivers for DC short problems. Nothing could possibly go wrong; go wrong, go wrong, go wrong . .

But of course it did. The first shipment of receivers, 1,000 in all, did not work. At all. Shades of 'The Entertainer'!

There were several reasons why the receivers did not work. The first receivers were supposed to come in a small lot (such as 100) to ensure that they would work before the Koreans cranked up full scale production. Again, shades of 'The Entertainer; they cranked up full bore the first day and forgot to turn the production line off! When the line was finally shut off, all 2,800 receivers covered by the first LC (letter of credit) were in North America. And not one worked!

Naturally Anderson chose not to 'renew' the agreement. They had built into the agreement some clauses which they had hoped would protect Anderson from faulty workmanship or merchandise. The clauses allow for dollar rebates for each defective unit. The clever Koreans had this one all figured out; they had apparently 'padded' their own costs to cover giving back a rebate on every receiver that

COOP/ continues on page 92

XL10A — THE ROOF MOUNT LIGHTWEIGHT CHAMP!

Microsat's versatile 3 meter screen antenna is at home on the roof or on the ground, and its light weight makes it easy to install. The reflector and mount weigh just 80 lbs. each, and assembles in under 3 hours. It comes complete with a Polarotor 1 feed and a remote control for antenna position and feed polarization. XL10A will remotely scan all the domestic satellites quickly and accurately, with higher C/N ratios than many larger antennas.

THE MICROSAT ADVANTAGE

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So why not let Microsat's experience with roof mount antennas get you off the ground.

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Microsat

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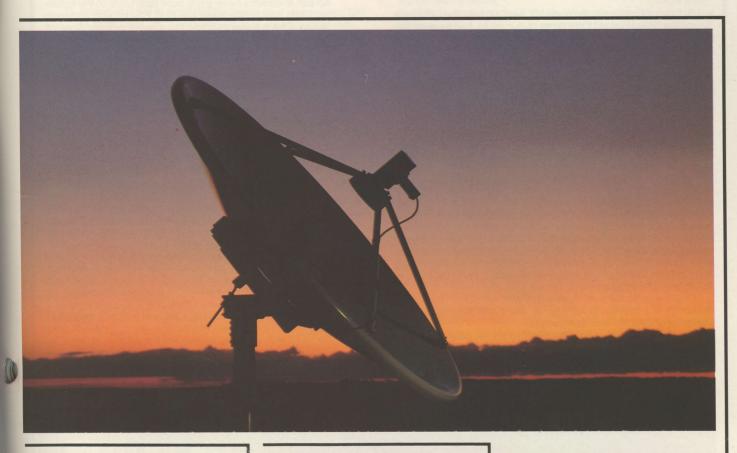
Considered the premier actuator in the earth station antenna industry, Duff-Norton® Actuators include these features:

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Quality dish antennas in 8', 10', 12' and 15' sizes are available, of course. But to get to the heart of the headend look at our receivers and modulators designed specifically for the SMATV market.

Our C4R synthesized tuned, block input receiver and C4LNB 120 low noise block downconverter have advanced satellite receiver technology. Now you can offer your customers CATV performance with these SMATV products.

This frequency agile receiver system has features and performance that are normally found in high cost products, yet it's extremely affordable.

Our frequency agile modulator, the FAM-300, is the industry's first low cost unit using SAW technology. Used with the C4R, it gives you superior performance plus the economy and convenience you need for saleable SMATV installations.

Quality products are not all we offer.

When you sell a General Instrument

SMATV system, you have a team of our engineers and system designers at your disposal. They are ready to offer their technical knowledge and experience to help you penetrate the growing SMATV market . . . and at no additional cost to you!

Plus you also have the cost-saving



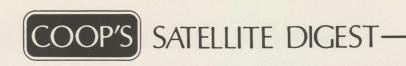
advantage of buying everything you need, from dish antennas to wall jacks, from one supplier.

Write or call today and find out how you can get a great SMATV reception with General Instrument.

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RF Systems Division
GENERAL INSTRUMENT CORPORATION

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COOP/ continued from page 89

was defective (including ALL of the receivers), and they would still make money!

At this point we have a 'burned' U.S. supplier, who, like the people behind the fabled Howard Entertainer back in 80/81, had a warehouse full of broken receivers. The Andersons immediately dug in to get the defective units operational and they are just about through them all as you read this. Unlike the folks behind 'The Entertainer,' they won't go bankrupt over this. But they had learned a lesson; or so they thought.

Then in mid to late May, they started getting some strange telephone calls from their distributors. The distributors were telling them that an outfit in the states, which said it specialized in disposing of 'overstocked merchandise,' had a warehouse full of Anderson Scientific TVRO receivers which it was willing to sell at bargain prices. The distributors were also being told that 'Anderson has gone bankrupt and is closing out their equipment . . .'. A totally untrue story, of course.

So where did this outfit get the warehouse full of receivers?

The plot thickens.

It seems that after Anderson decided they did not wish to renew their contract with the Korean firm, beyond the initial 2,800 (defective) receivers, the Korean firm went to one of the many (many) Korean 'trading companies' which specializes in bringing Korean goods to the USA. They struck a deal (Korean manufacturer to Korean trading company) and the trading company simply added TVRO receivers to its importing line. Ooops.

Only the receivers were Anderson TVRO receivers. Not copies; they were the real thing. As real as the 2,800 Anderson itself bought from the Korean contractor!

The Korean supplier had delivered his 2,800 receivers to Anderson, even though he had been told to stop the line after the first 100. Then he kept the line going and built gosh-knows-how-many more (several thousand as a minimum).

So now Anderson finds itself competing with Anderson.

There are several ways YOU, the dealer or distributor, can tell a South Dakota Anderson from what is probably a Korean Anderson.

- 1) South Dakota Andersons have a U.S. built downconverter (the Korean Andersons never got to build BDC Units so the receivers being sold super-cheap are NOT offered with Anderson BDCs). If the guy suggests you 'buy a Janiel' or some other 'off brand downconverter' to go with the 'special buy' receiver, that's your clue to head the other way.
- 2) South Dakota Andersons are sold ONLY BY Anderson appointed distributors (see their advertisement on page 21 here). The Korean Andersons are sold by seemingly a 'different company' every hour. These guys get on the telephone and make up new company names as often as they change underwear (perhaps more often, judging by the class of guy involved in this!). You protect yourself by only buying from an authorized Anderson distributor.

Now, perhaps it escapes you why you should not take advantage of 'such low prices' when they are offered to you. I'll elaborate:

- A) There is **no warranty** possible (certainly not from Anderson!) on this equipment. And I'm willing to bet that somebody who deliberately brings in 'counterfeit' receivers is not going to set up a U.S. repair facility to back them up; not when they are telling people on the telephone "Anderson is bankrupt and we are disposing of their overstocked inventory . . .". Good grief.
- B) If the quantity now being sold works like the first 2,800 Anderson brought in, they won't work out-of-the-box anyhow. Even if you see some working, don't be fooled. Look for a factory sealed unit that has NEVER been opened (since it left Korea) and try it out. It won't work.
- C) I doubt Janiel would knowingly sell you a downconverter to work with the Anderson counterfeits; even if you got your hands on one or some, you will find the Janiel unit has a full stage less-gain than the Anderson BDC and the pictures stink (after you get the indoor part of the system repaired and operating).

Mark and Keith Anderson notified me of their problems with the



counterfeit receivers immediately after they figured out what was happening. I've met with Mark at length to discuss this and I am convinced of two things:

1) Anderson is not in financial problems (and stories being told to 'hype sales' for the counterfeit units are pure hogwash):

2) The Koreans (not the whole nation, but certainly those involved in 'this intrigue') are guilty of everything from 'dumping' to patent infringements. Their moral code is not very good either.

Intrigued (pardon the pun) by all of this, I spent a day on the telephone talking with everyone in the industry whom I knew had been to Korea on business. I missed a couple who were 'in Korea' at the time but got to most. Each had some variation of this same story to tell me. And of each I asked 'Why are you still doing business there!'. Most explained that they were trying to get loose of the Korean clutches and they wished they had not been so impressed by the initial romancing effort from the Koreans. That's a pretty strong indictment for an entire national electronic industry.

I have never met a Korean I did not like. But then, I have not met very many Koreans. I get the distinct feeling that Korean electronic execs will tell you exactly what you want to hear regardless of what or where the truth may be. I believe they believe 'truth-in-business' is some sort of western bad-habit and it is not to be practiced.

I have generally characterized the Korean electronics industry as being 15 to 20 years 'behind' the Japanese electronics industry. In technology, this may well be true. But they are centuries apart in business ethics IF the examples cited here (and told to me) are

I hope that from this brief report you will take the time to look into any products 'made in Korea' which you might consider handling for resale. Look beyond the slick sales presentations. Anderson told me of one sales brochure he was shown which displayed some very popular hi-fi equipment. The Korean showing him the brochure said his firm manufactured that equipment. Anderson was duly impressed. When he got to Korea, he saw the exact same equipment sitting in mock-up form on a shelf. The same shelf where it had been mounted for the photo in the pamphlet. Inside was nothing; it was just a shell. He asked when that unit had been in production in THAT plant. The answer was revealing

"Oh . . . we never built those. We just make that box to take

I suspect Korean TVRO receivers have about as much chance of making 'pictures' as that hi-fi set had of 'making sound.' Caveat emptor . . . or however they say it in Korean.

COMING ATTRACTIONS

As soon as I had the June issue of CSD 'to bed' I climbed aboard an Eastern flight bound for North Carolina where I was to spend a too-short 20 hours visiting the people at Channel Master. This was a long-overdue visit that had its inception way back in the fall of 1979 and spring of 1980. When Susan and I were operating STT(I) out of our home in Arcadia, Oklahoma we had a couple of visits from a trio of Channel Master people. We sat around our living room talking about TVRO, what type of market I expected this to become, and where I felt Channel Master might make a contribution. It was not too long after that Channel Master entered the TVRO business, first using some privately-labeled hardware which they bought from the then-current list of suppliers in the industry.

Channel Master was bringing to the industry a very interesting new 'mix'; one of the best run, efficient, distribution programs in home electronics. For some years CM has been a corporate part of a much larger electronics family; AVNET. The AVNET family of electronic related firms did more than \$1,164,700,000 (that's a billion-plus) in 1983 so they are not exactly a small-time outfit.

Channel Master 'people' are its strength. Most of the top people have been there between 20 and 35 years and they start 'em young and bring them up through the ranks. It is a very stable, sound,

In addition to 'repaying' the 1979/80 era visits to my home, I was also anxious to see their new 'Microbeam' microwave system. Years (years!) ago when I was a CATV system owner and operator. I often wished that I had a system package that would allow me to 'jump' over

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OVER 45,000 ANTENNAS INSTALLED TESTED 73% EFFICIENT

A spun aluminum antenna is the finest you can buy. DH is a national leader producing 4000 antennas a month. We have more sizes and choices of F/D ratios.



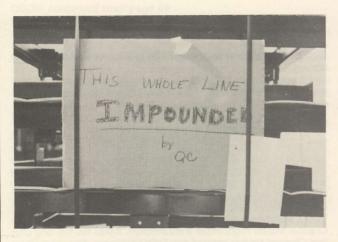
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QC GOT IT/ Channel Master dish mounts that didn't pass inspection are clearly marked for a return visit to the supplier. CM has one of the most elaborate and unforgiving 'QC' systems we have seen in the TVRO world.

up to 15 miles of 'fallow' ground with my trunk line signals and start anew in a new community or subdivision. Building a totally new headend every ten miles or so, just because 200 homes or so were spotted at such distances, seemed like a very poor way to build cable systems, to me, at the time. In the 70's Hughes came out with a system that allowed you to do this (AML) but they built it (and priced it) in the mis-belief they were still designing Jupiter space probes and by the time you got done pricing one of their AML systems you usually came to the conclusion that you could not afford it unless you had several thousand CATV homes at each 'microwave-drop' location.

The Channel Master Microbeam looks like it might solve that cost



RICHARD DERRENBACHER shows us how the Channel Master feed and polarization system is packed for shipment. CM buys the basic parts from Chaparral and then finishes it off in a custom way to accommodate their own control systems. Every single feed system is individually checked for performance before it is packed for shipment.

Luxor	Prodelin	III MI	CHAPARRAL	Scientific Atlanta	Ornell Spectra
Commander	Cinter of the Control	WILSON	WIERER	MA	d confeet

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M/A-COM introduces T-1 and H-1, the satellite receivers that deliver studio quality.

The system makes the picture, and our new receivers are an important part of the M/A-COM system.

M/A-COM receivers have microprocessor controls. When it comes to programming and tuning, the first time is the last time. No need to repeat the process every time a receiver is turned on. And in the event of a power failure, there's microprocessor memory retention.

Other M/A-COM receiver features include:

■ Parental supervision channel lock-out.

■ A single IR remote control for T-1, H-1 and for the new M/A-COM antenna positioner.

Acceptance of both mechanical and electronic polarization controls.

■ Programmable audio, with up to 72 audio memories on the H-1.

■ Dynamic Noise Reduction on the H-1 receiver; Dolby on the T-1.

■ User-friendly, attractive design.

In addition, M/A-COM's use of high quality block down conversion permits each receiver to have independent channel selection when multiple television sets are used in the same home.

M/A-COM Cable Home Group, Marketing and Sales, P.O. Box 1729, Hickory, NC 28603 800/438-3331 704/324-2200 Telex: 802-166







DICK DEUTSCH with some of the computerized test equipment CM uses to verify performance of equipment parts in a TVRO system. Every LNA is checked for gain and noise figure before it gets packed into a carton.

versus revenue problem. They allow you to plug your trunk line signal, with as many as 50 + channels on it, into this cute little 13 GHz range microwave transmitter. The CATV trunk line signals (typically operating between 50 and 300 plus MHz) are up-converted to the 13 GHz region and dumped into a dish that mounts up on the tower. The trunk line signal cables up to the dish because the 13 GHz electronics (and up converter) can be mounted right at the dish. This is important since you have very high transmission line losses at 13 GHz, even using appropriate waveguide.

Then at the receive site(s) you have a reverse system; a 13 GHz region microwave receiver and downconverter that translates the incoming signals back to their original CATV trunk line frequencies. It all happens at the tower mounted dish; again, no transmission line.

And I wanted to see this in operation since Channel Master has had a number of these systems operating for more than a year now.

I also wanted to tour the Channel Master production facility, talk with their antenna Guru Harry Greenberg (a 35 year veteran at CM) and get a feel for how they are doing in the marketplace

We somehow crammed four days of touring and talking into a nine hour day and when Richard Derrenbacher and Dick Deutsch dropped me back at the Raleigh/Durham airport at around 6 PM on the 15th I was exhausted. We had even managed to squeeze in a brief air-tour of their brand new 1,000,000 square foot facility near Smithfield, North Carolina. As you read this, Channel Master is moving from their present 150,000 square foot facility approximately 80 miles or so to Smithfield. The present facility is bursting at the seams with TVRO



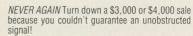
1,000,000 SQUARE FEET/ Smithfield (N.C.) plant for Channel Master is being occupied as you read this. Enough room to hold them 'until Christmas'!

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EASY TO USE A—Level tripod and head with orbital level. **B**—Set Azimuth with compass.

Set elevation with Inclinometer Peer thru sight tube for any obstructions.



NEVER AGAIN Put a dish in and not receive proper reception because you miscalculated the height of trees or buildings!

NEVER AGAIN Fumble with bulky Inclinometers and compasses!

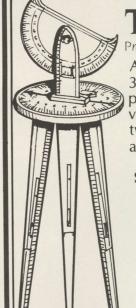
TAKE THE GUESSWORK OUT!!!

Your ABC Birdfinder will pay for itself on the first questionable site survey.

- STRONG—made from Velodized Aluminum.

- STRONG—made from Velodized Aluminum.
 COMPACT—Only 24" long (tripod folded).
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Precision instrument for Site Surveys.

Adjustable legs 2' to 31/2' 360° horizontal rotating plane. 90° — 0 — 90° tilting vertical element with a two part aiming vane and built in level.

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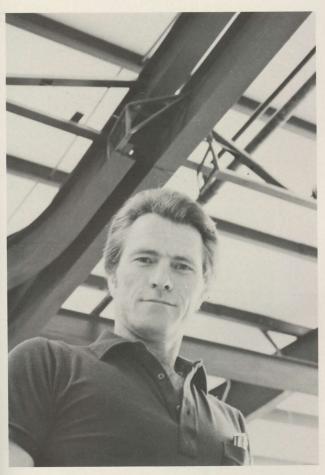
Post Paid

A must for microwave tree trimming. Made of strong durable ABS Plastic. Five interlocking pieces fit together without tools . . . Limited Supply offer

ATELLITE SYSTEMS DEVELOPMENT 760 Willow Street, Itasca, Illinois 60143 hardware and workers and they figure the expansion to a million square feet ought to hold them until Christmas or so. We'll look in some detail at all of this in future issues of CSD and CSD/2.

From North Carolina, back through Atlanta, I headed for Little Rock to visit with Randall Odom and some other fine folks in Arkansas. My visit to Arkansas was, again, overdue. Being the old stay-athome, stick-in-the-mud that I am, I just don't get out often enough to visit folks like I should

Randall started in the industry between the first SPTS show held in Oklahoma in August of 1979 and the next show held in Miami in February of 1980. He was messing around with fiberglass stuff in central Arkansas when a couple of guys who attended the first Oklahoma show found him. He got intrigued with fiberglass dishes and shortly thereafter found himself sitting in Robert Coleman's backyard in South Carolina in a pickup truck. Coleman had a couple of metalspun dishes and Randall's new 'partners' needed a 'mold.' The Coleman spun dish, scrounged from the military surplus market, became the first 'mold' for Starview antennas.



RANDALL ODOM beneath his overhead 'tramway' he designed to automate the flow of TVRO fiberglass dishes. Directly above his head is a 'switching station,' ala a railroad switching station, which allows the operator to divert product moving on the line from one segment of the plant to another.

Randall's visibility in the industry was purposefully 'muted' for several years. His 'partners' managed to keep him at home while they traveled around the country selling dishes and making bunches of money. Eventually Randall figured out what was happening and when he found an opportune moment bid them adieu.

Odom Antennas recently opened what I believe is the world's first automated production line for large size fiberglass TVRO dishes. I

COOP/ continues on page 100

Indispensable!



The DR601 Microwave Test Set represents the first major breakthrough in TVRO field test equipment. Specifically engineered for the professional installer, the 601 provides immediate answers to time consuming problems.

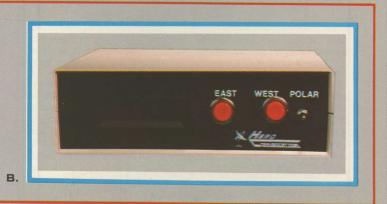
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THE HIGH





THE HERO 13 is a full foot larger than the tinker-toy 12 footers. It has strength no tinker-toy antenna ever had, and performance that runs 'rings around the toy like competition! A full foot bigger — a fat 1 dB more gain than the best of the 12 footers. And complete; a horizon to horizon motor drive (your customer's won't miss the new F2R, G2, birds with a Hero antenna!) that brings in true worldclass pictures from the FULL arc! Dealer friendly. A complete install kit; special drills, tools are packed with each antenna. You need NOTHING but a 1/4" hand drill, screw driver, and adjustable wrench. Everything else is included. MOTOR DRIVE, digital read out control (with built in Polarotor control) and a selfproofing feed; it checks itself and you KNOW you have maximum gain! No cables to prepare; our MASTER CABLE has all connectors in place; everything 'snaps together' in record time! You can actually install a HERO 13 as fast or faster than the tinker-toy 12 footers.

- A. Horizon to horizon motor drive. (uncovered)
- B. HERO digital remote control antenna positioner.
- C. Adjustable feed and LNA mount.

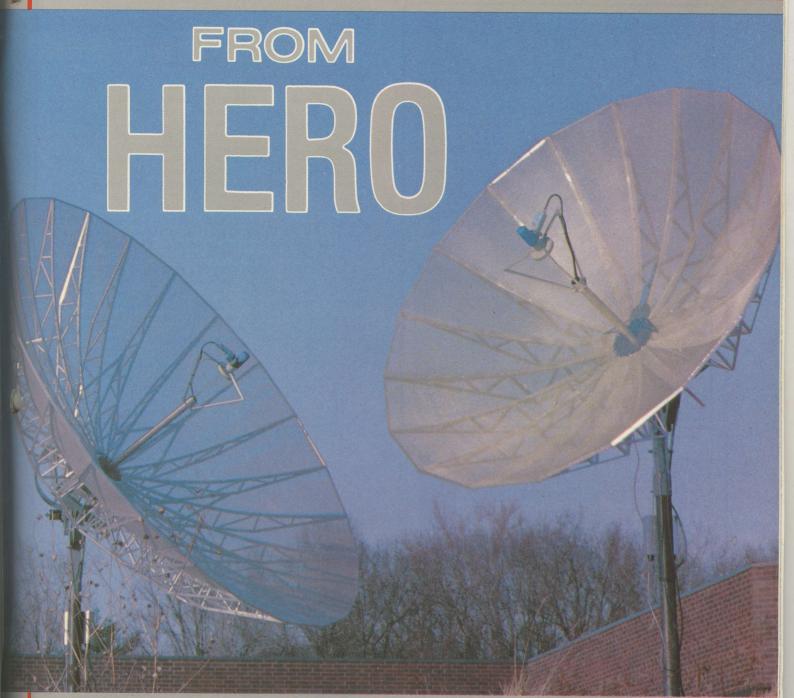




And we saved the best part for last. The price! As low as \$1,195 dealer net in small quantities for a 13 foot system that goes together faster, works better, and looks like a professional installation. Tired of playing with tinker-toy antennas? Graduate to the professional ranks with the HERO 13. If 13 foot of massive gain is too big for your area, HERO 10 offers all of the same dealer and user friendly features in a ten foot, high performance dish; at the even lower price of \$995 for a complete 10 ft. system. A few select dealerships are still available.

*The HERO 10 ft. and 13 ft. system includes: antenna • polar mount • horizon to horizon motor drive • digital remote control box • 100 ft. of cables with connectors • electromechanical limit switches.

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SUPER TENNA 13'

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MAKE YOU LOOK LIKE A PRO.

KNOWN the world-around for superb quality international-grade 'World Class' high performance TVRO systems, HERO is now offering the first truly high-quality, **professional class** domestic TVRO antenna systems. This is no panty-waist, tinker-toy antenna that 'clips' together; This is a professional antenna, built with the technology and experience that only HERO brings to the marketplace. It is significantly better, significantly higher in performance, and significantly more profitable for you to install!



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Suggested List

Dealer One: \$50.00

Dealer Five: \$46.00

608-493-2291

MERRIMAC PASPACE



COOP/ continued from page 97.

wanted to see how you automated a production line for something that is essentially 'hand-built'; a fiberglass dish.

I knew several people not directly associated with Odom were planning to be in Arkansas when I arrived but I was delighted to see Robert Coleman waiting with Randall as I crawled off of the jet. Coleman has been on a 'leave of absence' from the industry for a couple of years. Once, years ago, when I was visiting him at his South Carolina home, I casually mentioned that he might look into getting the then-ungranted cable TV franchise for his hometown of Travelers Rest. It didn't take long for he and I to drive the streets of the town and do a quick computation of how many bucks were involved in cabling the place, and after he applied for and was granted the franchise, he found himself very deeply involved in building and operating a cable system there. More recently he has gotten back into the TVRO world by introducing the SPACEvision line of LNAs. They come from Japan and Robert has been spending as much time in Japan as almost everyone else in the industry combined, of late.

My visit with Randall, Robert and a half dozen or so others lasted 30 hours or so. We watched them build fiberglass antennas 'the good, old fashioned way' in Randall's older plant (up to 70 + per day come out of the facility running as many as three production shifts) and we then moved to tour the facility that Odom just opened (see CSD/2 for May 15th) where fiberglass antennas will come off a true production line. Fascinating. And very educational. We also managed to take a short drive down to see another industry pioneer, Bobby Caylor. Caylor builds receivers these days and as we pulled up he was packing up a 500 lot shipment for a well known distributor in Tennessee whom he private labels for. Caylor spent the first 15 minutes of our visit shaking his head and repeating over and over 'I can't believe you guys are here!'. We hadn't warned him; just dropped in at around 6 o'clock at night. The place was still humming and being the subversive I am I counted 38 time cards in his time clock machine. He kept telling me he was a 'small operator' building receivers in his backyard. We were in his backyard alright (how he gets away with running a

production plant in his residential neighborhood baffled me) We will be 'looking at' how Odom turns out fiberglass productionline antennas (up to 3,200 a month capacity now) in a future issue. As luck would have it, later in my sojourn I ran into one of Bobby's receivers on a test bench where some equally subversive people were dissecting it for secrets and giving it a critical analysis. So between my brief visit at the Caylor plant and what I learned by peering over shoulders watching some qualified engineers 'rate' his receiver products, we'll also have a look at a 'small time operator's products from Arkansas' in a future issue as well.

Sixty hours after I left the sanity of Fort Lauderdale I was sitting at



PRODUCTION LINE DISHES/ all the way to the horizon. Dishes move along overhead tram from inception to cured-finish eliminating one of the biggest manpower and time consumers in fiberglass production; moving big, heavy parts from place to place for each step in the manufacturing process.



CONTINUOUS ROVING is applied to the dish super structure from a gun that really 'moves' the material. You could 'mummify' a fellow quicker than he could say 'TVRO' with this system.

the Combs Gate fixed base operation facility in beautiful downtown Denver waiting on Doug Dehnert. Dehnert and crew was picking me up in Denver since our paths could be forced to cross there and we were headed for Los Angeles as the first leg of the Dehnert trip to Johnston Atoll. A short flight later we were sitting in a rented car trying to figure out how to get down south of LA to visit the people at NSD who built the solid state broad banded power amplifier we were about to face on Johnston. After a tour of the NSD facility we headed back north a few miles and dropped in on Bob Maniaci and crew at Boman.

Last fall Tom Harrington and I, returning from some feed testing at Microwave Specialty Corporation in San Diego, had 'overnighted' in Los Angeles and been the guests of the Maniaci's in Downey for dinner. Now, I have traveled many places and I have eaten more than my share of exotic food. I would have to rate the cuisine at the Maniaci household in the top 1/10th of 1 percent of all of the food I have ever consumed. Mary Maniaci somehow not only finds time to raise six fantastic children but to also master the fine art of preparing food dishes from all over the world. The Maniaci's do their own share of traveling and I suspect Mary takes their travels as an opportunity to figure out how various food she encounters is prepared. Then she comes home and improves upon it. Harrington and I still talk about our dinner there last September and Dehnert and I got round two when we stopped for dinner this time. You can come and visit us in the Turks and Caicos ANYtime Mary, and the kitchen is yours!

Maniaci has received more than his share of 'publicity' since Boman entered the industry back in 1981 or so. Most of it has been negative although we have attempted to be objective when reporting on the various legal entanglements others have foisted upon the California firm. Our visit this time was more positive; we talked at length about the forthcoming CSD Fifth Birthday Party celebration. He committed Boman to be a part of the celebration including some television advertising in the TV special. He didn't want to talk about 'law suits' (too negative) so I didn't press. I do look for better, more positive things from Boman in the next 12 months and he and his people are among the best marketing types in the industry today.

Early the next morning Dehnert and I were standing in line waiting to get on board a DC-10 heading for Honolulu. Around 80 hours had elapsed since I left Fort Lauderdale and I was surprised, considering the schedule, how well I was holding up. Arthur C. Clarke had confided to me, recently, that he was finding long distance travel more and more of a pain and had about reached the decision that he would not be traveling very much in the future; if, indeed, at all. Since we both have chosen 'island environments' as our basic lifestyle, I could identify with that. But as long as industry people keep creating fascinating 'situations' such as the Johnston Atoll installation, and invite me along to help out, I guess I am stuck with keeping a small travel bag packed full time for a few years yet.

COOP/ continues on page 104

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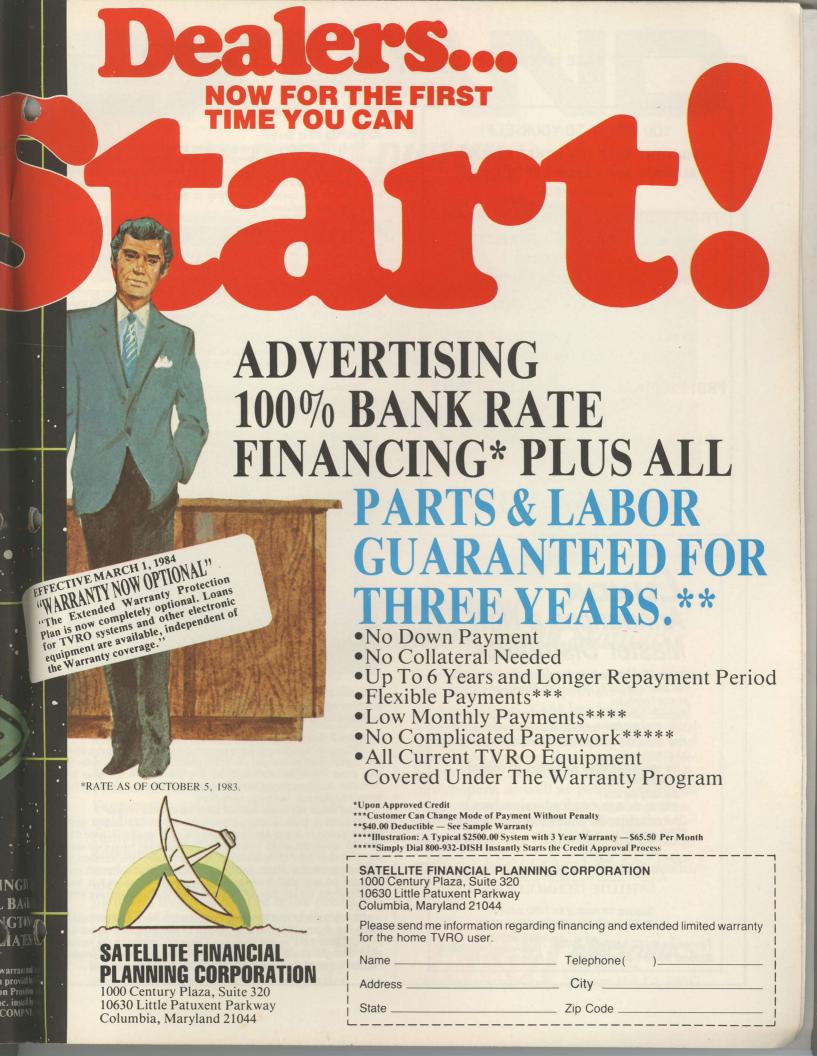


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JOHNSTON Post Script

'Now, the decision to move to Galaxy is yours.' Doug and I were pointing out to some of the Johnston people that **we were not there** to tell them which 'signals' to select nor to make any recommendations on program re-use. 'We'll tell you where the best quality will be, and help you get the system functioning at the selected satellite; but ultimately, that decision is yours.'

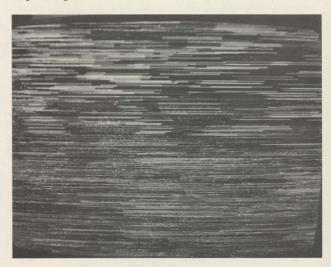
"We want HBO," said the man. We told him they were ultimately planning to scramble the G1 feeds. "We still want HBO," he repeated. OK, G1 it would be.

Later the discussion renewed. "Do you think they will sell us a decoder?" we were asked. Our first reaction was that if there are 350 military type people stuck off on an isolated island 850 miles from anywhere, and they had the equipment to get HBO, and they wanted it, HBO would be well advised to accommodate them. "Suppose they don't see it that way?" they pondered. Then we move to attack plan two, I responded.

"What's that?" they asked.

'Well, I have the home phone number here for a guy named **Biondi.** He's a top guy at HBO. You simply get on the horn and call him.'

"What good will that do? Do you think going over the heads of the underlings we'd get their permission and cooperation"? I thought it might.



WE COULD PROBABLY DECODE THIS Link-Abit signal if HBO was kind enough to send a gift decoder to the hard working guys on Johnston (TR3, G1).

"And if that doesn't work"?

'OK, you tell him that you have several dozen 50 gallon drums filled with **Agent Orange** and you are in the process of cutting an order to ship those drums to **his home**, as a 'present' from the guys on Johnston. Just a momento, like sending somebody a postcard with the scrawled message 'wish you were here.'

"You mean we make him an offer he cannot refuse"?

'You got it. Look, you guys have got the world's largest (and probably only) supply of Agent Orange. It's a pity you can't share this with the rest of the world. I think every home should have their very own 50 gallon drum of the stuff; just as a reminder of the wonders of modern chemical warfare. And you'll make Biondi the first gift just because he and HBO have provided you with so much fun and entertainment. It's just like sending a friend a box of pineapples from Hawaiil'.

"It might work! And if it doesn't do the job, we could probably find a few drums of Nerve Gas we don't need here as a 'follow-up present.' Wow! We've got resources here on Johnston we never even thought about. How about Showtime; got any telephone numbers there? And the Movie Channel . . . and Disney and . . ."

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